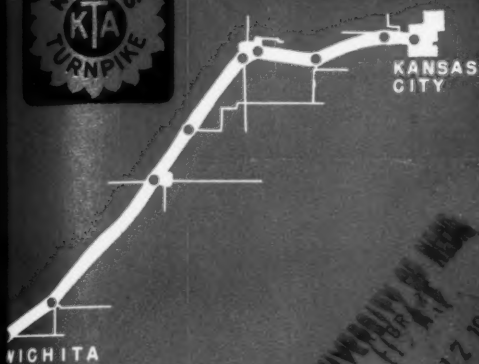




## KANSAS TURNPIKE ROUNDUP



# Contractors and Engineers

SEPTEMBER 1956

magazine of modern construction



## Rocky Mountain highway needs skid-resistant pavement

Constructing skid-resistant Texaco Asphaltic Concrete pavement on U. S. Route 550, where this highway crosses the Molas Divide in Colorado at an elevation of 10,000 feet.

### CONTRACTORS

Lowdermilk Brothers Construction Company, Denver, Colo.

Sterling Sand and Gravel Company, Fort Collins, Colo.



Completed Texaco Asphaltic Concrete surface at the left and the 6-inch broken stone base at the right.

U. S. Route 550 crosses the Molas Divide near Silverton, Colo., about 10,000 feet above sea level. On the curves and grades of such a mountain highway, dependable skid-resistance is an exceptionally important quality in a pavement.

A hot-mix Texaco Asphaltic Concrete pavement has been constructed on this 6.8 mile section of US-550. Laid to a compacted thickness of two inches, this skid-resistant, rugged wearing surface is supported by a six-inch foundation of crushed stone. The Texaco asphalt surface and the stone base form a completely flexible pavement from the subgrade up, which is capable of absorbing heavy traffic year after year, with a minimum of maintenance.

Hot-mix Texaco Asphaltic Concrete is one of many heavy-duty, intermediate and low-cost types of construction for highways, streets, airports and parking areas obtainable with Texaco asphaltic products. Helpful information about the methods and materials recommended for all these types is supplied in two free booklets. Copies may be obtained without obligation from our nearest office.



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# TEXACO ASPHALT

For more facts, use Reader-Reply Card opposite page 18 and circle No. 201

SEPTEMBER

# Contractors and Engineers

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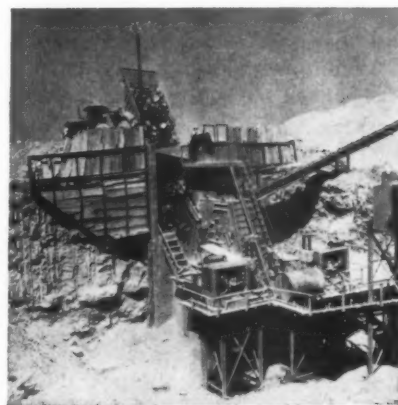
Kansas Turnpike paving operations.

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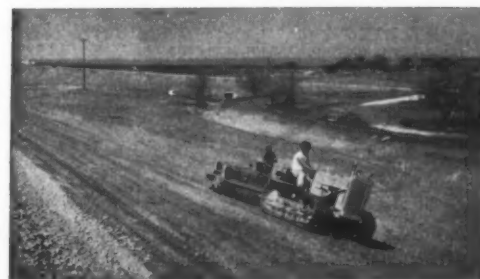
Hot-mix plants turn out material.

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Crushing plants supply aggregate.

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Roadside development along pike.

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## Last of the Toll Roads?

The 236-mile Kansas Turnpike, opening next month, may be one of the last of the toll roads to be built in this country. With the federal government putting up 90 per cent of the cost of the interstate highway system, and the states the remaining 10 per cent under the new Highway Act, it is obvious that few "authorities" or highway departments will propose new toll roads. Existing toll facilities will not suffer of course. They will be integrated into the new system, since the federal and state governments will not construct highways parallel to these toll facilities to put them out of business. Congress has under advisement a proposal to buy out the owners of toll roads, but for the present these expressways will maintain their existing status.

Generally, toll roads are financially healthy, excepting the 88-mile West Virginia Turnpike which is not yet paying its way. This "road to nowhere", as it has been termed, suffers from lack of adequate approaches and connections at both ends. The New Jersey Turnpike is now carrying traffic loads that were not anticipated until 1981, and the 118-mile pike is only four years old. The Ohio Turnpike, a little shaky financially at the start, is now producing income to match the engineering estimates.

Toll revenue on the New York State Thruway increased 76 per cent during the first half of 1956 over the comparable period of 1955. With its final 3-mile section through Yonkers now complete, a sufficient volume of traffic is expected so that this 427-mile superhighway will attain financial stability without difficulty. That veteran of toll roads, the Pennsylvania Turn-



pike, is a money-maker with its mainline portion, although extension revenue is below expectations.

In such good financial position is the Maine Turnpike that there is reluctance to make it a free road even when its bonds are retired. The prospect of a \$10-million or so annual income from the toll road as revenue for the state is pleasing to the local taxpayers. Florida has similar ideas for its 324-mile long Sunshine State Parkway linking Jacksonville and Hollywood, near Miami. The initial 110-mile segment between Hollywood and Ft. Pierce is scheduled to open the first of the year. Tourists can be expected to account for the larger majority of toll revenue on both the Maine and Florida pay-as-you-ride roads, and this is a strong appeal to the states involved. Florida authorities also point out that the entire Sunshine State Parkway could probably be completed in about three years, if financed as a toll road, while it might take 13 years to build as a tax-supported highway under federal aid.

On the New Jersey Turnpike, a corridor linking the great Eastern population centers, about 75 per cent of toll revenue is derived from out-of-state traffic. The Turnpike Authority is understandably reluctant to forego this

revenue when its bonds are liquidated. The various authorities are influenced, no doubt, by the many toll bridge and tunnel projects that charge tolls even when they are completely paid for.

Right now toll roads under construction are being pressed to completion. The 40-mile Kentucky Turnpike opened a little over a month ago. Last month the first 88-mile section of the Northern Indiana Toll Road went into service, and by mid-November the remaining 68 miles will be ready. By that time also the east-west 123-mile Massachusetts Turnpike is expected to open. The 129-mile Connecticut Turnpike will be finished some time next year, as will two turnpikes in New Hampshire, 23 and 40 miles long.

But elsewhere—in Ohio, Texas, Washington, Michigan and Oklahoma—plans for proposed new toll roads, or extensions of existing facilities, are being dropped or reappraised. In Pennsylvania, the Department of Highways has taken over the planning of a 46-mile connecting link between the New York Thruway and a proposed Ohio Turnpike extension—a project previously proposed as a toll road. The era of toll road construction seems to be drawing to a close as tax-supported highway building moves ahead.

### CONTRACTORS AND ENGINEERS

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CONTRACTORS AND ENGINEERS



Two Koehring 34-E Twinbatch pavers, fed by Mack trucks with Anthony bodies, move steadily down the length of the Kansas Turnpike as the 55-mile concrete roadway section is placed. Concrete for the first 7-inch lift is dumped by the first paver, then struck off by a Blaw-Knox spreader before reinforcing mats are placed and the remaining 3 inches

of concrete placed by the second paver. The Mack batch trucks carry four 37.4-cubic-foot batches and are equipped with air-operated releases on the intermediate gates. Page 6



# Contractors race time to meet October opening of new Kansas Turnpike

Next month's opening of the Kansas Turnpike—which runs 236 miles from Kansas City at the Missouri State line southwestward to the South Haven interchange and the Oklahoma border—will mark the completion of one of the biggest road jobs undertaken by Kansas in years. The four-lane divided highway is paved with concrete for 55 miles and with asphalt for 181 miles.

Equaling the combined construction programs of several of the larger state highway departments, this work is big by any standards. In the 55 miles between Kansas City and Topeka, the 110 miles of 24-foot-wide 10-inch-thick concrete slab was laid on a 4-inch crushed stone and 1-inch sand-cushion base. Cushion stone mat shoulders were laid 10 feet wide on one side of this roadway and 4 feet wide on the other.

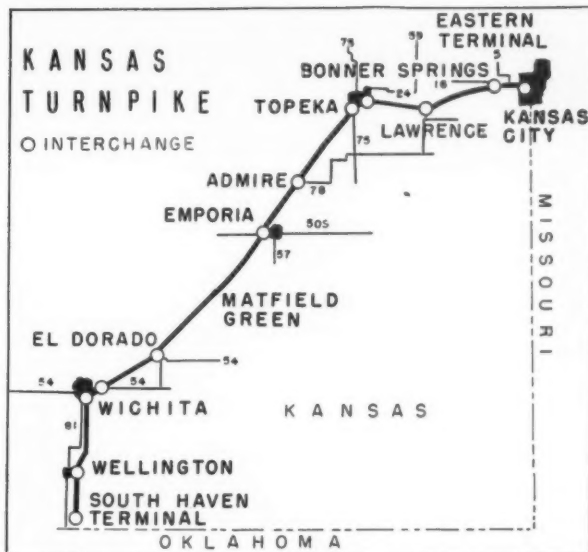
This is only the beginning of the 4-lane pavement. Add an additional 362 miles of flexible pavement, consisting of 18 inches of crushed stone or gravel base and subbase, varying from 38 to 44 feet wide, and a 24-foot pavement of 4 inches of hot-mixed asphaltic-concrete-binder and surfacing, together with mat penetration shoulders. This is the 181-mile 4-lane flexible pavement carrying the pike to the Oklahoma border. Then add interchange ramps, acceleration and deceleration lanes, service areas, and the reconstruction of all intersecting roads and highways to this total. Still, this is not the end of the work. For such things as construction of about a thousand miles of right-of-way fencing, and seeding along the 236-mile route have to be done. As in any job of this size, there were difficulties in such things as securing hauling units to keep aggregates moving from crushing plants to the roadway. The complications made it doubly important that the work be well planned and well supervised. But since most of the paving contracts were awarded in the summer and fall of 1955, contractors had a good opportunity to plan their layouts and operations during the winter.

Ground was broken for the job on December 31, 1954, and grading continued through most of 1955. The first portland-cement concrete pavement was put down on October 24, 1955 but practically all the paving work was done in the current season. Bituminous paving did not get under way until May 10 of this year.

How this summer's jobs on concrete paving, bituminous pavement, aggregate production, seeding, and fencing

were hurried along to meet the opening date of the turnpike is detailed in the special Kansas Turnpike report in the pages that follow.

THE END



SECOND ONLY TO THE PANAMA CANAL in earth-moving magnitude, this 8½-million-yard cut will result in a canyon 1,370 feet wide and 350 feet deep at San Francisco's Carquinez crossing. Although much rock is being encountered, blasting is kept to a minimum and rippers and scrapers help keep the pace close to 30,000 yards per two-shift day! Goodyear 3-T Nylon Cord HARD ROCK LUG tires are taking this tough job in stride.

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# Big batch trucks set par

**Four firms complete virtually  
all of 55-mile section  
of divided superhighway  
in one construction season**

(Additional plate on front cover)



**1.** Typical of paving operations are those on the 23-mile section under contract to Tecon Paving Co., Dallas. Following recompaction of the grade, the crushed-stone base is compacted by Tampo 9-wheel rollers pulled by Farmall tractors.

C&E Staff Photos



**3.** The inch of sand leveling course over the base makes it possible for a Ferguson subgrade planer, pulled by an International ID-9 tractor, to bring the course to exact grade. The Cat No. 12 grader spreads the sand.



**4.** Two Koehring 34-E Twinbatch pavers, fed by a fleet of 12 Mack B-42 trucks with Anthony dump bodies, average 2,600 feet per day. Pavers work from the median since they are not permitted to operate on the shoulder or roadway grade.



**7.** The burlap covering is laid back while workmen "dry-saw" the 1¾-inch center joint with self-propelled Champion saws and the 1½-inch transverse joints with manual Champion saws.



**8.** Within 24 hours, joints are filled with Flintkote CPS cold-applied rubber-asphalt sealing compound. The sealer is applied by a Graco pump pulled by the Le Roi Tractair that operates the pump and blows joints clean.

CONTRACTORS AND ENGINEERS

**2.** The base is Schran

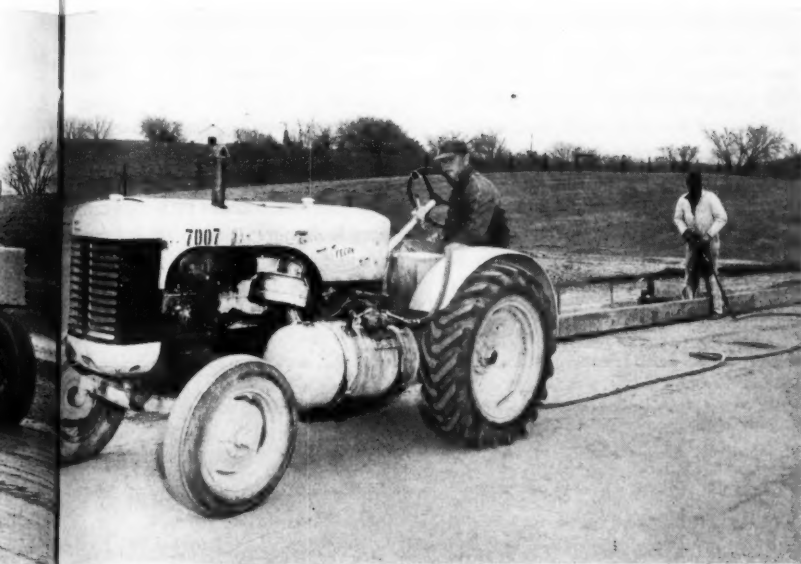
**5.** The shop-m by a K

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SEPTE

# pair concrete-paving crews

by RALPH MONSON, field editor



2. The Blaw-Knox 9-inch paving forms, with a 1-inch wood shim bolted to the base to provide for the 10-inch pavement, are held by form pins driven by a Schramm air hammer powered by a Le Roi Tractair.



5. The first 7-inch lift is struck off by a Blaw-Knox spreader equipped with a shop-made wheel device for placing center-joint tie bars. Viber vibrators powered by a Kohler generator on the spreader work along each form.



9. After the 48-hour wet-burlap curing period, Carter-Waters Hunt Process white-pigmented curing compound is applied by a Flex-Plane curing spray that travels the slab on rubber-tire wheels.

High-speed batching and hauling—mainly responsible for rapid concrete-paving operations on the Kansas Turnpike this summer—will enable contractors to put the finishing touches on the newest of the nation's superhighways sometime next month.

While the turnpike's concrete-slab section is 55 miles long, interchange ramps, service areas, and spur access roads bring the concrete mileage to 61.13 miles. Paved by four contractors in the past six or seven months, this road is equal to more than 120 miles of standard 24-foot-wide pavement 10 inches thick.

Contractors on the work proportioned dry batches from big, modern plants equipped with twin weigh batchers. In one case, two cement-batching plants were set up side by side to speed the work of loading a truck fleet hauling to the pavers.

Some of the contractors worked from two plants to hold down haul distances; others leapfrogged their plants ahead to new locations when part of the work had been completed.

Large trucks, hauling four and even five batches per load, helped speed the operation and reduce the number of trucks, and consequently, the number of drivers needed. Unusually long hauls, up to 10 miles, had a compensating effect. On one of these, one contractor found that 40 of the large trucks were needed to keep his two Twinbatch pavers supplied. In one round these trucks carried 162 batches. Starting and stopping an operation of this size required careful planning.

Four concrete-paving contractors handled the entire job, the projects ranging from 7 to 23 miles in length—including ramps and service areas



6. The concrete is covered with a double layer of burlap and is kept wet for 48 hours by a spray from a Euclid 3,000-gallon water tank. This is done as soon as possible after the slab has been finished.



10. Set in a straight line for drive-through loading is the Blaw-Knox 100-ton two-compartment aggregate bin, right, the two 400-barrel cement plants, and the 100-ton sand hopper.



A 21-ton load of crushed-rock base material is dumped on the recompacted subgrade by a Timpfe dump trailer on an International truck. Another truck waits to back in with its load before a grader begins spreading the material.

C&E Staff Photos

—and from \$1.6 to \$4.2 million in price. The first 16 miles at the Kansas City end was paved by J. A. Tobin Construction Co., Inc., Kansas City, Kans.; the next 23 miles—the largest concrete-paving project in the job—was done by Tecon Paving Co., Dallas, Texas. Western Contracting Corp., Sioux City, Iowa, built the next 15 miles, and the final 7-mile segment at Topeka was constructed by Koss Construction Co., Des Moines, Iowa.

The operations of all four contractors were basically similar, but there were some differences in the procedures and in the equipment used. Preparation of the subgrade, placing and compaction of the base, concrete paving, and construction of the bituminous-surfaced crushed-rock shoulders were done in that order.

#### Recompact subgrade

Since most of the grading had been done during the 1955 season, leaving the subgrade subject to the effect of moisture and frost of last winter, there was some loss of density near the surface of the subgrade, and the top 6 inches had to be reworked.

Recompaction of this half-foot of subgrade to the required 100 per cent density—the first operation done by the contractors—meant first getting optimum water content into the soil. Where soil was too moist, Tecon Paving Co. used a Rome disk to aerate it; where it was too dry, water was added by water trucks or the big Euclid water wagons. Caterpillar No. 12 motor graders scarified, mixed, and shaped the materials to the proper grade and section.

Compaction was handled by Ferguson 50-ton pneumatic rollers, Tecon pulling the roller with an Allis-Chalmers HD-20 tractor, while Western used a Caterpillar DW20. Both of these contractors used Caterpillar DW20 scrapers to move material where the excess or shortage was greater than the motor graders could handle.

Placing of the 4-inch compacted crushed-stone base followed the subgrade compaction. A mixture of crushed rock and sand was found best suited for the base course. Sometimes this material was premixed; in other cases the materials were dumped on the roadway and mixed in a windrow by motor graders.

The base was then watered to optimum moisture content, thoroughly

mixed by the motor graders, carefully spread to grade, and rolled with 8 or 10-ton tandem steel-wheel rollers. Usually, the base was built about 25.5 feet wide for the 24-foot pavements to provide support for the paving forms.

#### Sand leveling course on base

Since compaction of the relatively large rock made the crushed stone base very hard, and finishing with any type of subgrade planer difficult, an inch of sand leveling course was provided over the base.

After paving forms had been first set up on the base, brought to line and grade, and tamped, trucks dumped the sand between the forms, where it was spread with a motor grader. The remainder of the paving operation

was, in general, similar to the usual highway-paving project.

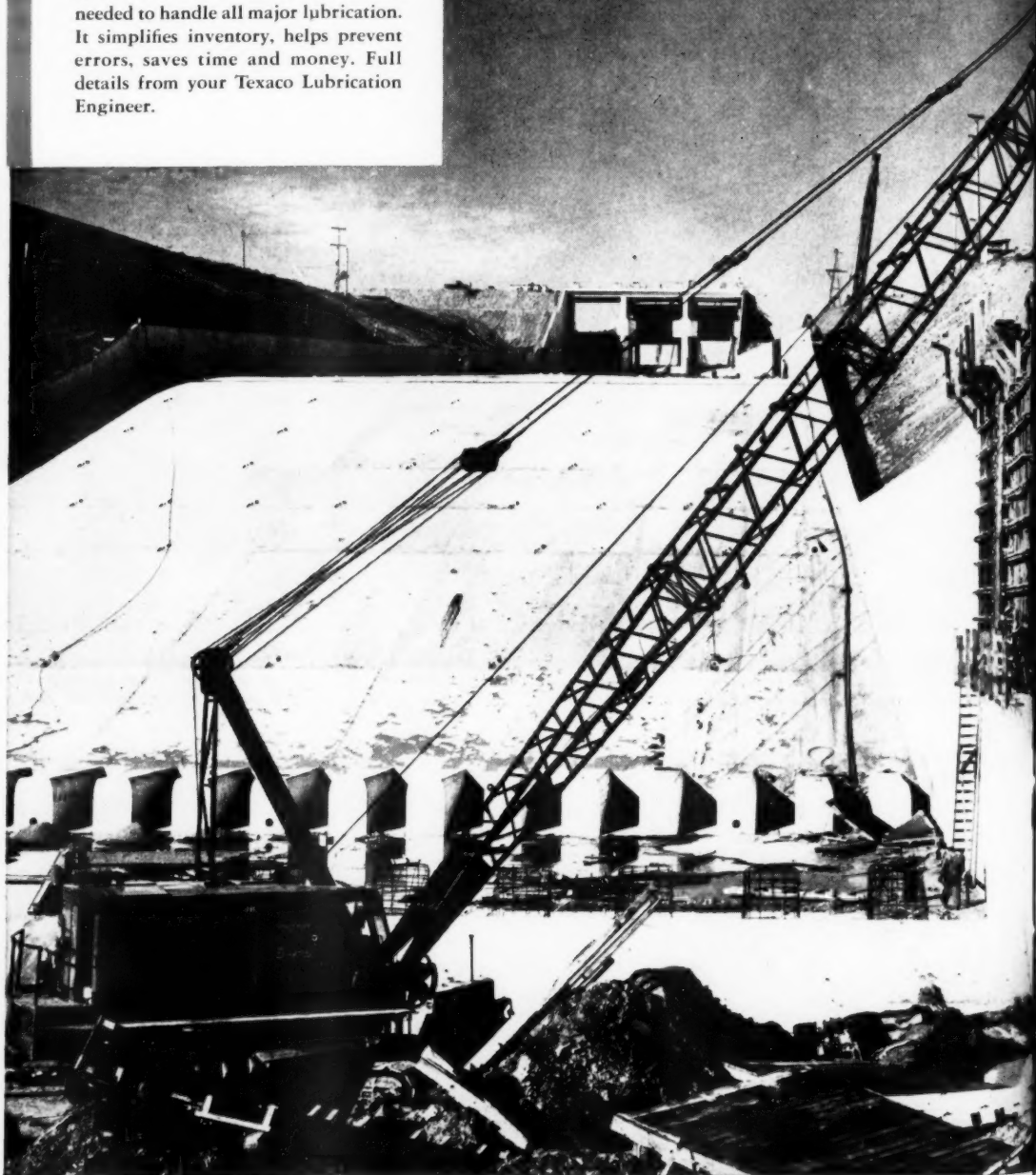
#### Biggest contract

Tecon Paving Co. used 5,000 road feet of Blaw-Knox steel paving forms for its 23-mile section. Most of these were standard 9-inch forms, with a 1-inch wood shim bolted to the base to provide for the 10-inch pavement. Form pins were driven by a Schramm air hammer powered by a Le Roi Tractair. A Cleveland form tamper consolidated the ground under the forms.

The sand leveling course was brought to exact grade by a Ferguson subgrade planer pulled by an International ID-9 tractor. The Caterpillar No. 12 motor grader that spread the sand also helped pull the planer. A

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# TEXACO

CONTRACTORS AND ENGINEERS

SEPTEMBER

Buffalo-Springfield 10-ton three-wheel roller then compacted the sand, leaving the grade ready for the paver.

The paving crew placed as much as 3,000 linear feet of pavement in a 10-hour day, and averaged about 2,600 linear feet per day for weeks during favorable weather. The two Koehring Twinbatch pavers that mixed the concrete and placed it on the grade had to work from the 20-foot center median since they were not permitted to operate on the outside shoulder or on the roadway grade. When the second roadway was started, the pavers had to move back to the start of the job instead of simply turning around and working their way back.

As the first paver placed enough concrete to form the lower 7 inches of the slab, the material was struck off

by a Blaw-Knox spreader fitted with two Viber vibrators, one working along each form. A shop-made wheel device at the rear of the spreader placed the center-joint tie bars. As soon as this spreader passed, four workmen carried in the mats of reinforcing steel and laid them in the fresh concrete.

The remaining 3 inches of concrete was placed by the second paver and finished by a train of equipment including a Blaw-Knox spreader, two Blaw-Knox finishing machines—one equipped with a tamper—a Koehring longitudinal finisher, and a Flex-Plane power-belted machine and burlap drag. The two finishers were required equipment.

As soon as possible after finishing, the concrete was covered with a dou-



A Caterpillar No. 12 grader spreads the windrow of crushed rock before water is applied and the material mixed. In some cases, the crushed rock and sand base-course material were premixed. This was the first operation following recompaction of the subgrade that had been put down before the winter of 1955-56.

ble layer of wet burlap that was kept wet for 48 hours by a spray from a Euclid 3,000-gallon water tanker. After 48 hours, the burlap was removed, and the surface and edges of the slab were coated with Carter-Waters Hunt Process white-pigmented curing compound. A Flex-Plane curing spray coated the surface, while a workman with a hand spray applied the curing compound to the edges of the slab.

#### All joints are sawed

The burlap covering was laid back while both transverse and longitudinal joints were cut by three Champion concrete saws using abrasive blades. All joints were sawed dry, a self-propelled machine sawing the center joint to a depth of 1¾ inches, and two manually propelled models sawing the transverse joints to a depth of 1½ inches. Depending on the weather, sawing was done from 8 to 12 hours after the concrete had been placed. The Champion abrasive blades produced from 800 to 1,800 linear feet of joint before they were worn too small to use.

The sawed joints were filled within 24 hours with Flintkote CPS cold-applied rubber-asphalt sealing compound. The barrels of joint compound and the Graco pump transferring the viscous material from the barrels to the applicator nozzle were pulled on a four-wheel trailer by a Le Roi Tractair. Air from the Tractair blew the joints clean ahead of the filling and also operated the Graco pump.

During the time that the slab was being cured under the wet burlap, the forms were removed. Using a special hook, a Ford-mounted Pitman Hydra-Lift pulled the form pins, then picked up the heavy forms and loaded them on the bed of the truck. Two Ford trucks equipped with Hydra-Lifts kept busy handling the forms and the heavy rolls of wet burlap.

#### Trucks haul four batches

Tecon's batch plant, laid out for rapid trouble-free batching, kept the fleet of Mack B-42 batch trucks rolling steadily to and from the pavers. Each of the big tandem-axle trucks, equipped with Anthony dump bodies, carried four 37.4-cubic-foot batches. The intermediate gates in these trucks were equipped with air-operated releases so that the driver could trip the gates by operating a series of

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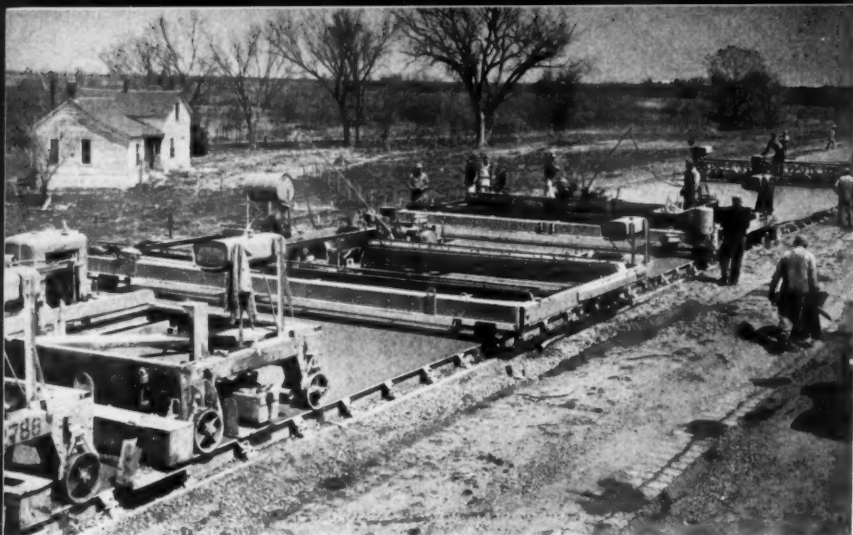
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Photo courtesy Engineering News-Record

# Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

For more facts, use Reader-Reply Card opposite page 18 and circle No. 203



Following two Jaeger-Lakewood finishers in the Western Contracting Corp. paving spread are two Koehring longitudinal floats, used to cut down on the amount of hand finishing required. The last rig in this lineup is a Flex-Plane powerbelting machine.

C&E Staff Photo

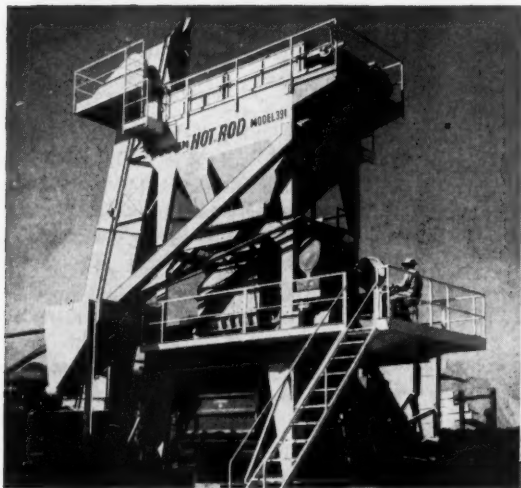
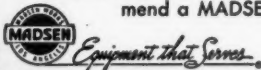
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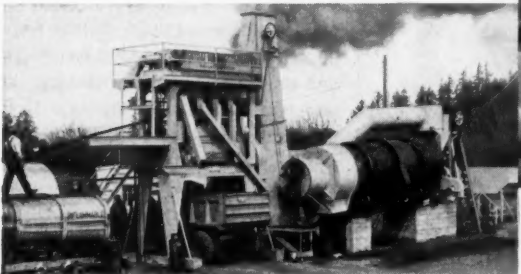
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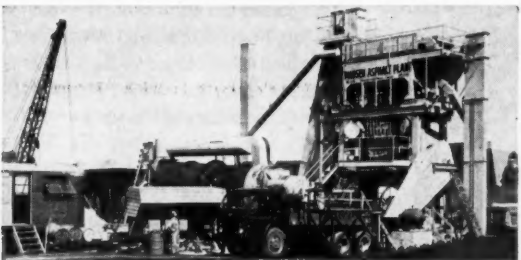
MADSEN Asphalt Plants are built in capacities from 1000-lbs. to 6000-lbs. per batch to meet your requirements. Take advantage of the big money-making opportunities ahead and see your MADSEN Distributor... let him recommend a MADSEN Plant to fit your requirements.



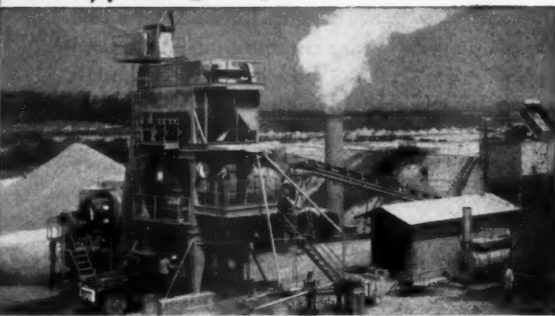
MADSEN HOT ROD Model 391... newest addition to the MADSEN family of outstanding asphalt plants. Available in 3000-lb., 4000-lb. and 5000-lb. capacities. Easily produces in excess of 200 T.P.H. (Ask for Catalog No. 391.)



MADSEN 2000-lb. SPECIAL Asphalt Plant... ideal for the not-too-large contractor, the municipality, and the large contractor who wants a small type of operation for producing approximately 480 tons per 8-hour day. (Ask for Catalog No. 20-S.)



MADSEN 3000-lb. Asphalt Plant... a fast-producing plant in the 3000-lb. class. Close grouping of controls, adequate platforms, easy accessibility for servicing are some of the advantages of this popular plant. (Ask for Catalog No. MP-120-83.)



MADSEN Model 481 Asphalt Plant... built in 4000-lb., 5000-lb. and 6000-lb. batch capacities. Designed for the ultimate in portability. Incorporates many MADSEN "firsts" that speed production and reduce maintenance costs. (Ask for Catalog No. 800.)



### THERE'S MORE PROFIT FOR YOU IN A MADSEN ASPHALT PLANT because...

- \$ MADSEN Asphalt Plants are built for faster, easier operation... less operator fatigue. That adds up to more tonnage per day.
- \$ MADSEN Asphalt Plants are designed for easier accessibility. That means less time required for maintenance.
- \$ MADSEN Asphalt Plants incorporate many superior engineering features that speed production.
- \$ MADSEN Asphalt Plants are designed for maximum portability... they set up faster too.



**MADSEN WORKS**  
BALDWIN-LIMA-HAMILTON  
CONSTRUCTION EQUIPMENT DIVISION  
DIVISIONS: Austin-Western • Eddystone •  
Electronics & Instrumentation • Hamilton •  
Lima • Loewy-Hydropress • Madsen • Pelton  
• Standard Steel Works

ASPHALT PAVING PLANTS • PUG MILL MIXERS • AGGREGATE DRYERS • DUST COLLECTOR UNITS  
ROAD PUG TRAVEL-MIX PLANTS • WEIGH BATCHERS • SUPER FLOAT AND JOHNSON FLOAT FINISHERS  
ASPHALT TANKS • ROYAL CROWN PUMP VALVES • ASPHALT AND FUEL PUMP UNITS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 204

(Continued from preceding page)

levers in the cab. The end gate was tripped by the usual hand method to release the first batch; the other three were released by the air trips. This was particularly advantageous, because the exceptionally large boxes were high in the air once the truck bed had been raised.

The 12 Mack batch trucks, painted Tecon's light green color, were carefully washed after each day's work so they looked fresh and new even after many days of dusty batch hauling.

There were several unique features about the batch setup, which was equipped with two complete and independent cement-batching plants to speed up the loading of cement. These

two plants and the bins for batching the rock and sand were arranged in a straight line. The batch trucks drove in at one end, loaded the batches of rock, drove straight through the two cement plants loading two batches in each plant, and continued straight on to the sand batcher where the sand was placed on top of the cement to keep it from blowing.

This arrangement, making it unnecessary for trucks to back or turn, eliminated delays and congestion in the plant area, and undoubtedly reduced the number of batch trucks which ordinarily would have been required.

The crushed-rock coarse aggregate was furnished by B. L. Anderson, Cedar Rapids, Iowa, from a quarry and washing plant at Lawrence, and delivered by truck. The aggregate stockpile was maintained by a shovel, and the Blaw-Knox 100-ton bin was charged by a Bucyrus-Erie 38-B. Both rigs used 1½-yard Blaw-Knox clamshell buckets.

Sand for the concrete was produced by Holliday Sand & Gravel Co., Kansas City, Mo., from pits at Bonner Springs and Lawrence. A Bucyrus-Erie 38-B crane with an Owen 1½-yard clam charged the Blaw-Knox 100-ton sand hopper, while an Allis-Chalmers HD-15 tractor-digger pushed the sand up to the crane.

Although the Lone Star cement plant at Bonner Springs was only a few miles from the end of the job, a combination of rail and truck delivery was used. At a siding a short distance from the plant, a Blaw-Knox under-track screw and elevator transferred the cement from the bulk cars to the six covered dump trucks that hauled from 45 to 50 barrels per load.

These trucks dumped into hoppers at the batch plant, and screws and elevators carried the cement to the two Blaw-Knox 400-barrel cement plants that, like the sand and rock bins, were equipped with twin weigh batchers so that two batches could be weighed and discharged at a time. The plant was originally set up near the northeast end of the project while the first 6.5 miles of road was paved. Then it was moved to another site at Lawrence, and the remainder of the project was batched from there. Using the three cranes at the batcher and a number of trailers, to dismantle, move, and reassemble the plant, the new setup was ready for use in less than three days.

Water for the paver as well as for the compaction of the subgrade and base, curing, and dust abatement, came from streams adjacent to the right-of-way. At the east end, the water was pumped from Stranger Creek by Jaeger 3 and 4-inch pumps that kept an elevated 5,000-gallon tank filled. A 6-inch discharge line from the tank and a quick-opening valve made it possible to load the trucks quickly.

Each of the pavers pulled a two-wheel trailer carrying a 1,000-gallon water tank by means of a 3-inch pipe tongue that also brought water from the trailer to the paver. A fleet of six Ford and Chevrolet trucks with 1,300-gallon tanks shuttled between

CONTRACTORS AND ENGINEERS

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#### Western Contracting spread

On the 15.37 mile section west of Lawrence, Western Contracting Corp. used a paving train quite similar to Tecon's, though everything was painted Western's Orange instead of Tecon's green. The 5,000 feet of Heltzel 10-inch steel forms were secured by pins driven with a Joy hammer. The hammer was powered by a Jaeger compressor mounted on a jeep and driven by the jeep engine. A Pitman Hydra-Lift on a Chevrolet truck handled the heavy forms, and the crew set them in place as they were picked off the truck.

When the sand base course had been cut to exact grade by a Carr subgrade planer pulled by a Caterpillar No. 12 motor grader, the paving train moved in. It included two Koehring Twinbatch pavers, two Blaw-Knox spreaders, two Jaeger-Lakewood finishing machines, two Koehring longitudinal floats, and a Flex-Plane power-belt machine. The second longitudinal float was added to make the pavement smoother and to cut down on hand finishing.

Pavement joints, sawed with Clipper and Target concrete saws using Target abrasive blades, were filled with Flintkote CPS sealer. A Lincoln Kleenseal pump, operated by air from a Jaeger 125-cfm compressor, pumped the sealer from the barrels to the applicator nozzle. The compressor was mounted on the Chevrolet truck that carried the pump and the barrels of sealer.

A Flex-Plane curing spray on rubber-tire wheels traveled the finished slab to apply Carter-Waters Hunt Process white-pigmented curing compound.

#### Long batch hauls

Big batch trucks also characterized Western's fleet. Its 12 International R-210 tandem-axle trucks, hauling four batches to the load, were augmented by hired trucks that varied in number with the length of the haul. Most of them were International.

(Continued on next page)

Western Contracting Corp. uses a Pitman Hydra-Lift on a Chevrolet truck to pick Heltzel 10-inch forms off the truck and set them in place. C&E Staff Photo



A workman on the Western spread uses a Lincoln Kleenseal pump to apply the Flintkote CPS joint sealer to longitudinal and transverse joints. The Jaeger 125-cfm compressor on the bed of the Chevrolet truck supplies air for this operation and for joint-cleaning work. C&E Staff Photo



**"Far as I'm concerned the CAT\* No. 12 Grader is it!"**

—Chas. M. Loser, Supt., Kiely Construction Co.  
Butte, Montana

During the summer of 1955, Kiely Construction Co. completed a \$238,000 job of rebuilding 7.15 miles of secondary road between Stevensville and Florence, Mont. Excavation and borrow on the project amounted to more than 220,000 cu. yd.

Pictured here is one of Kiely's Caterpillar No. 12 Motor Graders, leveling fill on the 32-foot subgrade of the roadway. This No. 12 was purchased late in 1950 and has worked well over 6000 hours. Says Superintendent Loser: "As far as I'm concerned the Cat No. 12 is it! They never give us a bit of trouble."

Long, trouble-free life is a common characteristic of Caterpillar Motor Graders. And when you're ready to trade them in you can count on high resale value. Old Cat No. 12s don't wear out. They just keep on doing their job somewhere else. Over 99% of all the Cat Graders ever built are still at work!

The present No. 12 has all the built-in ruggedness of earlier machines, and the same excellent job visibility, ease of blade positioning, accuracy and operator

comfort. But in addition it gives you a 115 HP Caterpillar Diesel Engine and other new features. There's an exclusive *oil clutch* that runs up to 1500 hours without adjustment; *tubeless tires* that eliminate tube and flap trouble and reduce tire down time, at no extra cost; and in-cab starting—optional direct electric or gasoline engine.

Your Caterpillar Dealer not only sells these big yellow machines but backs them up with reliable parts and service. Let him show you what the new No. 12 can do, right on one of your own jobs.

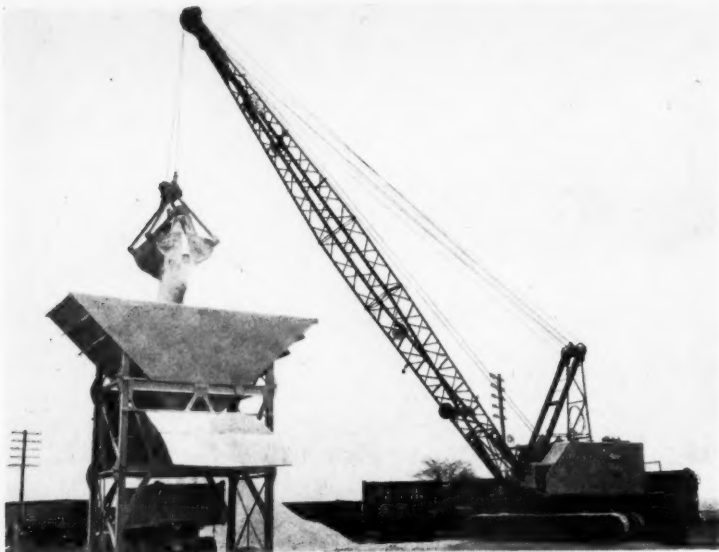
Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

**CATERPILLAR\***

\*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

**NAME THE DATE...  
YOUR DEALER  
WILL DEMONSTRATE**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 205



A Bucyrus-Erie 54-B crane with Blaw-Knox 3 1/2-yard clamshell charges a Johnson 80-ton bin at the rail siding used by Western.  
C&E Staff Photo

(Continued from preceding page)

tional RF-212's, carrying five batches per load. Approximately 40 trucks were required to keep the two pavers supplied when hauls went to 10.5 miles. At one time, there were 162 batches in a single round.

This contractor used two batch plants, one located near each end of the job. The coarse aggregate was received by rail and was handled from the cars to the bin by a Bucyrus-Erie 54-B crane using a Blaw-Knox 3 1/2-yard clam. This rig was able to unload the cars as well as charge the Johnson 80-ton bin.

Cement was batched from a track-side plant, designed and built by the contractor, that was equipped with Johnson twin weigh batchers and a 450-barrel storage silo. The rock and cement batching plants were located on the same siding, but they were more than 1,000 feet apart so that unloading operations for rock and cement did not interfere with each other.

The sand batcher was in a pit more than a half mile away. A Link-Belt Speeder LS-85 crane, owned and operated by the sand producer, charged the sand into a Johnson 80-ton bin to be weighed in twin batchers into the trucks.

#### Pump water over two miles

Western's water for all paving and base operations came from wells in the Kansas River basin. Two complete setups were used, one near each end of the work. At the east end, the water was obtained from a 50-foot well drilled into water-bearing strata near the batch plant. A 10-inch 10-stage Peerless pump, driven by a 75-hp General Electric motor, pumped water through 13,000 feet of 6-inch high-pressure aluminum irrigation pipe to a 10,000-gallon storage tank at the right-of-way. A setup duplicating this one was located near the west end of the project.

Two Euclid water tanks, each with a capacity of 6,500 gallons, hauled water from the storage tanks for earthwork, curing, and dust abatement. Three International R-180 trucks with 2,000-gallon water tanks supplied the pavers.

An ingenious system made it possible for the water trucks to serve both pavers from a single connection. A small Jaeger pump was mounted on the rear paver and connected to the lead paver by a long hose. This hose was carried along the side adjacent to the forms so that it was out of the way of batch trucks and other traffic. The water truck was coupled to the rear paver. A simple manipulation of valves supplied water to either or both of the pavers.

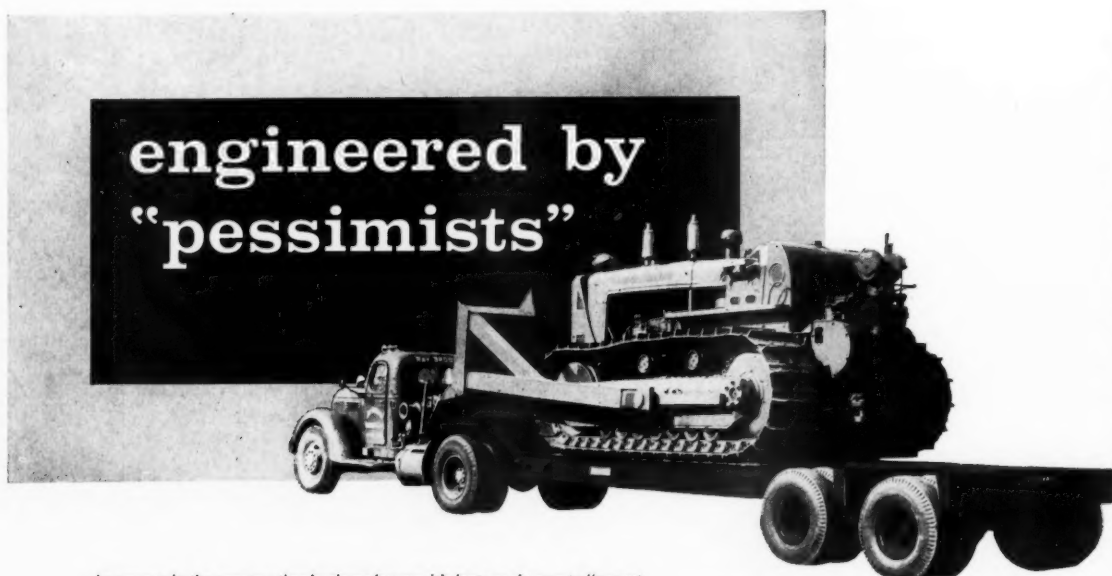
#### Pin puller saves time

Form pins were removed by a power puller that was used by one operator. Manufactured by Urschel Engineering Co., Inc., Bowling Green, Ohio, this small air-operated machine rapidly pulled the form pins straight out. The machine made the process faster than ordinary hand methods, and since only one man was needed to use the puller, the operation was considered more economical than if the Hydra-Lift were used.

#### Equipment servicing

Both Western Contracting Corp. and Tecon Paving Co. maintained excellent lubrication and maintenance facilities on the project. Large trailers well stocked with spare parts and convenient field shops made it possible for well-trained mechanics to perform

CONTRACTORS AND ENGINEERS



As anyone in the construction business knows, it's just good sense to "expect the worst and you won't be disappointed." That's why we stress the fact that the rated capacities of Dorsey Heavy-duty trailers are always conservative, providing a margin of safety against adverse conditions. Our engineers realize the serious losses that can result from failure of equipment that hauls construction machinery.

We invite close scrutiny of all Dorsey specifications: Dimensions of main beams and all other structural members will show any engineer that Dorseys are built "with trouble in mind."

Note, too, that Dorseys come complete with lights, brakes and other items needed for highway use, and tires are full-sized for capacity loads.

#### MODEL HTS LOW BED

20 Ton capacity — Weighs Only 8,250 pounds  
(Also available in 15, 25, 30, 35 ton capacities)  
Although as much as a ton lighter than other trailers of comparable capacity, high-tensile steel main channels and close-spaced all-welded cross members give the HTS superior strength and ruggedness. Flat gooseneck provides support for blades and other loads.

#### NEW SELF-LOADING FLOAT

This trailer will actually carry 45,000 pounds concentrated in 10 feet of its length! The secret is the extra-deep high-tensile steel main frame that we "tailor" to length and load requirements:

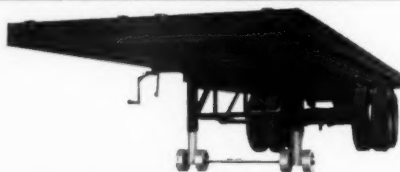
14 inches deep on floats 28 through 31 feet.  
16 inches deep for lengths through 35 feet.



#### THE GIANT PLATFORM

44,000 lb. capacity — Weight: 8,410 lbs.

In the year since its introduction, the Giant, with its 18-inch-deep main frame, has become America's No. 1 platform! Although as much as 2,000 lbs. lighter than other platforms, it has even greater strength.



#### TANDEM TILT-TO-LOAD

15,000 and 20,000 capacities — Weights: 2,500 and 2,700 lbs.

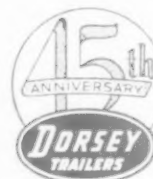
Speed and efficiency as well as economy are combined in this versatile tilt model: it's so light a dump truck pulls it easily. Two-way hydraulic control is so precisely balanced the weight of a man will tilt it up or down. Single axle models also available.



For the complete facts on any model heavy-duty trailer, see your Dorsey Distributor — or wire collect.

**DORSEY TRAILERS / ELBA, ALABAMA**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 206





One of Tecon's Cat DW20 scrapers is serviced by the company's Ford F-600 lube truck, which carries four Graco pumps, a Graco compressor, tanks of gasoline, diesel fuel and water, and a Kohler generator for powering floodlights.

C&E Staff Photo

any job, from minor adjustments to complete overhauls, right on the site.

Daily lubrication and routine maintenance were handled by special crews with well equipped rigs. A typical lube rig on the Tecon spread was a Ford F-600 truck carrying a Graco lubricating system, consisting of air-compressor, four Graco Fireball pumps, and reels and hoses for dispensing motor oil and three kinds of grease. A Kohler light plant provided power for emergency lighting or operation of small power tools. Emergency supplies of diesel fuel, gasoline, and water were also carried on the truck.

The contractors also made excellent use of their Motorola mobile radio systems to keep close contact with all phases of the work. Western used six mobile units in addition to the base station in the field office, while Tecon had a total of 10 units in operation.

#### Personnel

Supervising the entire operation for Tecon Paving Co. was project manager S. N. Foster. Paving superintendent was C. H. "Buster" Simpson. Base operations were run by V. J. "Turk" Wooley, while Cliff Terry was foreman of the grading crew.

For Western Contracting Corp., G. E. Williams was project manager. He was assisted by paving superintendent L. C. Shellman, base superintendent Daniel Everist, office engineer James Nutt, and office manager Earl Townsend. The concrete foreman was M. A. Zittritsch.

General engineering consultant to the Kansas Turnpike Authority is the firm of Howard, Needles, Tammen & Bergendoff. Josef Sorkin is resident consulting engineer on the project. General manager of the Turnpike Authority is Gale Moss. THE END

#### Architecture dictionary

An introduction to the subject of domestic architecture through the ages is available in a new book, "A Dictionary of English Domestic Architecture", by A. L. Osborne. Written for both students and amateurs, the book gives details of history, planning, structure, ornament, and design through the definition technique. Drawings illustrate the more important definitions.

Priced at \$6, the book is available through the Philosophical Library, 15 E. 40th St., New York 16, N. Y.

#### Road Show official dies unexpectedly

Harold F. Hess, executive vice president of the Construction Industry Manufacturers Association (CIMA) and a key figure in the planning and organizing of the 1957 ARBA Road Show, died unexpectedly early last month at his home in Evanston, Ill.

CIMA, which Mr. Hess had served as executive vice president since 1949, is the equipment manufacturers' division of the American Road Builders' Association. As such, it is responsible for staging the forthcoming Road Show.

In recent months, Mr. Hess had devoted most of his time and energy to coordinating the work of various com-

mittees charged with arranging specific details of the gigantic exhibit, to be held next January at Chicago.

ARBA and CIMA officials have paid warm tribute to their late colleague. John N. Robertson, president of ARBA, cited the "vigor and integrity" with which Mr. Hess served the equipment branch of the highway industry, and termed his death "a sad loss . . . to all segments of the industry."

CIMA president Kenneth Lindsay, executive vice president of the Iowa Mfg. Co., paid tribute to Mr. Hess for his loyal service to the industry, and in particular for his efforts on behalf of the coming Road Show.

## One tool does what four did before! NEW THOR UTILITY AIR HAMMER



Thor exclusive stop rotation gives you a light demolition tool, a drill, a light clay digger, a chipping hammer—all in one compact tool.



Thor Model 15 Utility Hammer converts instantly from a self-rotating rock drill to a non-rotating hammer with a flick of an external cam lever.

Now THOR offers a better all-purpose tool—a tool which drills, chips or breaks concrete and masonry. Only the compact Thor Model 15 Utility Hammer has instant stop rotation.

The Thor Model 15 Utility Hammer is easy to handle, easy to use and mighty easy on air. Try this amazing new tool. Any Thor distributor will be glad to give you a demonstration. Thor Power Tool Company, Aurora, Illinois.



#### THOR POWER TOOL COMPANY

Atlanta • Birmingham • Boston  
Buffalo • Chicago • Cincinnati  
Cleveland • Denver • Detroit  
Houston • Los Angeles • Milwaukee  
Newark • Long Island City, N.Y.  
Philadelphia • Pittsburgh • St. Louis  
San Francisco • Seattle  
Toronto, Canada • Export Division,  
New York City

For more facts, use Reader-Reply Card opposite page 18 and circle No. 207

## Contractors and Engineers to publish **ROAD SHOW DAILY**

Plans to publish six editions of a daily newspaper during the 1957 ARBA Convention and Road Show have been announced by CONTRACTORS AND ENGINEERS.

The Convention and Road Show will be held next January 28 through February 2 at Chicago. The *Road Show Daily* will be published Sunday, January 27, through Friday, February

1. The initial edition, making its appearance on Sunday, January 27, marks the opening of the Associated Equipment Distributors convention, also being held in Chicago.

Present plans call for the daily to be a 40 or 48-page newspaper of standard C&E size (tabloid), employing newspaper-type makeup while retaining some of the characteristics of

CONTRACTORS AND ENGINEERS magazine.

Representatives of all sections of the road-building industry have responded with enthusiasm to the announcement of plans to publish the *Road Show Daily*. Officials of the American Road Builders' Association, the Construction Industry Manufacturers Association, and the AED, as

well as representative contractors and equipment manufacturers, have expressed interest in the exhibit newspaper.

The daily's six editions will be designed to keep those attending the Convention and Road Show informed of convention activities, exhibit features, and other aspects of the important week-long program.

A daily press run of at least 7,500 copies of the paper is planned. Distribution will be at the major convention hotels in Chicago's Loop, with present plans calling for delivery of the newspaper to hotel rooms. Some copies will also be available at the CONTRACTORS AND ENGINEERS booth in the Chicago Amphitheatre, scene of the Road Show.

In addition to coverage of the AED and ARBA conventions and the Road Show itself, the daily will contain news about the exhibits and the products being shown, sidelights on the convention and exhibit, news about important visitors and outstanding figures in the roadbuilding industry, information about where to dine in Chicago, and other special features.

An important feature of each edition will be the exhibitors' advertisements calling attention to their displays and inviting visits to their booths. Space rates may be obtained from any C&E representative or by writing to CONTRACTORS AND ENGINEERS, 470 Fourth Ave., New York 16, N. Y.

### Rowe heads committee for Chamber of Commerce

Fred I. Rowe, partner and general manager of the W. L. Johnson Construction Co. & Associates of Columbus, Ohio, has been appointed chairman of the Construction and Civic Development Department Committee of the National Chamber of Commerce for 1956-57. The committee deals with the over-all improvement of cities and the development of construction markets, helping to guide Chamber legislative policy in those areas.

### New York expressway open

The final link in the Major Deegan Expressway, a nine-mile artery between West 176th St., and West 193rd St. in the Bronx, New York City, was completed little more than three weeks ago.

Costing \$54 million, the expressway is part of the National Interstate Highway System. It provides a direct 6-lane link to the New York Thruway at the Westchester County line. At the opposite end, it joins the Major Deegan Blvd., which will be reconstructed to modern standards.

Ask

**Cedarapids**  
Built by IOWA

**Owners about Profit...**

Someplace near you there's sure to be a Cedarapids plant working. Ask the owner what he thinks about the performance of that plant!

We'll bet you get answers like these—

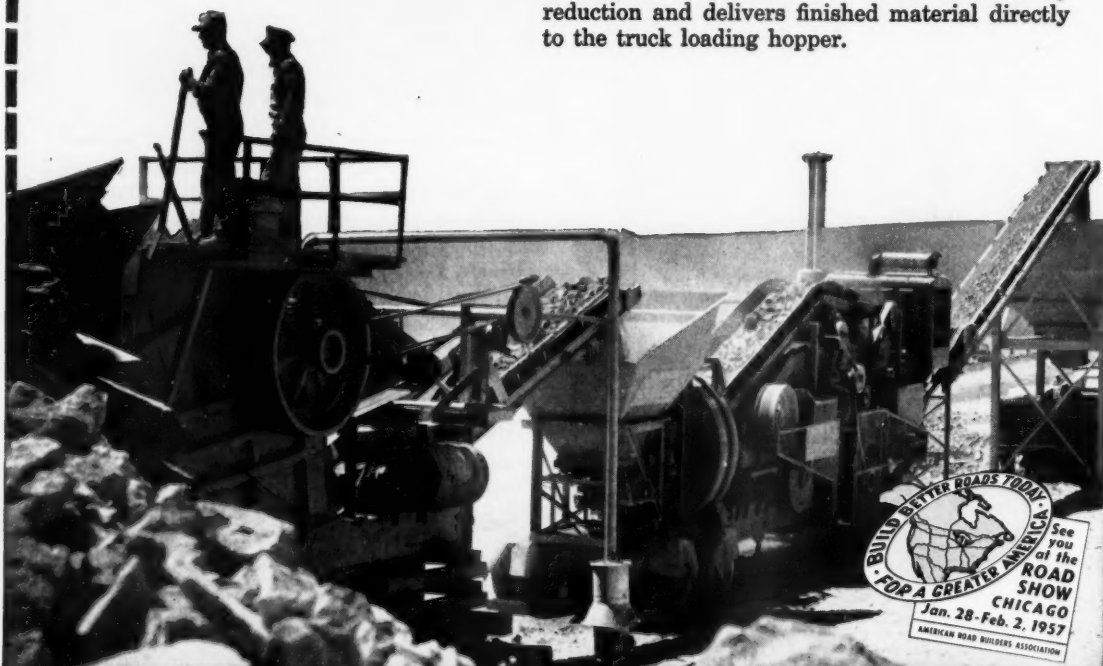
"We're crushing 100%, averaging 105 tons per hour, with no maintenance costs in 12 months' operation"—a New York Commander owner.

"The only competition I have around here is another Cedarapids plant"—a Wisconsin crushing plant owner.

Call your Cedarapids distributor for the location of the nearest working Cedarapids plant—then ask him to explain the Cedarapids features that will make more money for you.

**SUSQUEHANNA QUARRY CO.**  
produces  
**150 TONS PER HOUR**  
of crushed rock for  
**Pennsylvania**  
**Turnpike Extension**

Set up to produce about 75,000 tons of crushed stone for sub-base on the north end of the Pennsylvania Turnpike Extension, this 3-unit Cedarapids plant is turning out 150 tons per hour for Susquehanna Quarry Co., Millersburg, Pa. Rock from an abandoned strip mine is fed to the 25"x40" primary jaw crusher over a vibrating grizzly which bypasses fines before they reach the crushing chamber to permit greater production of crushed material from the Portable Primary unit. The versatile Cedarapids Commander is used for secondary reduction and delivers finished material directly to the truck loading hopper.



**IOWA MANUFACTURING COMPANY**  
Cedar Rapids, Iowa, U.S.A.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 208

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# convention calendar

## September 16-22 American Society for Testing Materials

Second Pacific Area National Meeting and Apparatus Exhibit, Hotel Statler, Los Angeles, Calif. Fred F. Van Atta, assistant secretary, ASTM, 1916 Race St., Philadelphia, Pa.

## September 17-19 National Highway Conference for County Engineers and Officials

Fourth Annual Conference, Grand Hotel, Mackinac Island, Mich. B. F. Ostergren, managing director, County and Local Roads Division, ARBA, World Center Bldg., Washington 6, D. C.

## September 19-20 Modern Masonry Conference

Conference conducted by Building Research Institute of National Academy of Sciences Under Sponsorship of Allied Masonry Council. Hall of Flags, U. S. Chamber of Commerce Building, Washington, D. C. Robert J. Denny, public relations advisor, Henry J. Kaufman & Associates, 1419 H St. N. W., Washington, D. C.

## September 23-26 American Public Works Association

Meeting and Exhibit, Will Rogers Auditorium, Fort Worth, Texas. D. P. Herrick, executive director, APWA, 1313 E. 60th St., Chicago 37, Ill.

## September 30-October 2 American Congress on Surveying and Mapping and the American Society of Photogrammetry

Meeting, Shirley-Savoy Hotel, Denver, Colo. ACSM-ASP, P. O. Box 1407, Edgewater Branch, Denver, Colo.

## October 2-5 Ohio Short Course on Roadside Development

Short Course of Instruction, Deshler-Hilton Hotel, Columbus, Ohio. Wilbur J. Garbhausen, chief landscape architect, State Highway Department, 450 E. Town St., Columbus 15, Ohio.

## October 15-17 American Bridge, Tunnel and Turnpike Association, Inc.

Meeting, Broadview Hotel, Wichita, Kans. John Allyn Stearns, secretary, ABTTA, P. O. Box 748, White Plains, N. Y.

## October 15-19 American Society of Civil Engineers

Pittsburgh Annual Convention, William Penn Hotel, Pittsburgh, Pa. Don P. Reynolds, assistant to the secretary, ASCE, 33 W. 39th St., New York, N. Y.

## October 22-24 National Lubricating Grease Institute

Meeting, Edgewater Beach Hotel, Chicago, Ill. T. W. Miller, executive secretary, NLGI, 4638 Nichols Parkway, Kansas City 12, Mo.

## October 22-26 National Safety Congress and Exposition

Forty-fourth Congress and Exposition, Conrad Hilton Hotel, Chicago, Ill. R. L. Forney, secretary, NSC, 425 N. Michigan Ave., Chicago 11, Ill.

## October 24-25 American Concrete Institute

Meeting, Mount Royal Hotel, Montreal, Quebec, Canada. William A. Maples, secretary-treasurer, ACI, 18263 W. McNichols Road, Detroit 19, Mich.

## October 24-25 National Slag Association

Meeting, Sheraton-Park Hotel, Washington, D. C. E. W. Bauman, managing director, NSA, 613 Perpetual Bldg., Washington 4, D. C.

## October 25-26 National Society of Professional Engineers

Fall Meeting, The Greenbrier Hotel, White Sulphur Springs, W. Va. NSPE, 2029 K St. N. W. Washington 6, D. C.

## October 29-November 1 American Institute of Steel Construction

Meeting, The Greenbrier Hotel, White Sulphur Springs, W. Va., L. A. Post, executive vice president, AISC, 101 Park Ave., New York 17, N. Y.

## November 12-19 American Concrete Pressure Pipe Association

Eighth Annual Convention and Meeting, Castle Harbour Hotel, Tucker's Town, Bermuda. Howard F. Peckworth, managing director, ACPPA, 228 N. LaSalle St., Chicago 1, Ill.

## November 14-16 Virginia Highway Conference

Conference, Virginia Military Institute, Lexington, Va. R. P. Ellison, executive assistant, Virginia Department of Highways, 1221 E. Board St., Richmond, Va.

## November 25-30 American Society of Mechanical Engineers

Annual Meeting, Statler Hotel, New York, N. Y. D. B. MacDougall, ASME, 33 W. 39th St., New York 18, N. Y.

## November 26-28 American Concrete Pipe Association

Fifth Annual Short Course of Instruction, Chase Hotel, St. Louis, Mo. Howard F. Peckworth, managing director, ACPA, 228 N. LaSalle St., Chicago 1, Ill.

## November 27-30 American Association of State Highway Officials

Meeting, Traymore Hotel, Atlantic City, N. J. Kenneth Rice, secretary, New Jersey Highway Department, 1035 Parkway Ave., Trenton, N. J.

## December 6-7 Mississippi Valley Flood Control Association

Meeting, Roosevelt Hotel, New Orleans,

La. Al Bourgeois, Hotel Roosevelt, New Orleans, La.

## January 28-February 2, 1957 American Road Builders' Association

Combined Conference and Road Show, Congress Hotel, Chicago, Ill. Louis W. Prentiss, executive vice president, ARBA, World Center Bldg., Washington, D. C.

## Allis-Chalmers appoints

H. R. Godfrey, Jr., has been appointed assistant to the general manager of the General Products Division of Allis-Chalmers Mfg. Co., Milwaukee, Wis. He had been a specialist in the chemical and petroleum section of the company's New York, N. Y., district office prior to his present appointment.

The firm has also promoted J. C. Baseheart to the position of engine

sales manager, and has named F. M. Borwell as his assistant. Both had formerly been associated with firm's Buda Division in Harvey, Ill.

## Diesel engine analysis

■ A catalog from Cummins Engine Co., Inc., answers questions on the compression ratio, ignition, and power ratings of diesel engines. Information is also given on the supply and economy of fuels, the diesel fuel system, 4 and 2-cycle engines, and supercharging and turbocharging. Tables, graphs, and diagrams are included in the catalog.

To obtain the catalog write to the Cummins Engine Co., Inc., Fifth St., Columbus, Ind., or use the Request Card at page 18. Circle No. 33.



## QUEBEC HYDRO-ELECTRIC COMMISSION USES EIMCO 105 TRACTOR-EXCAVATORS ON BERSIMIS PROJECT

The Quebec Hydro-Electric Commission supplied contractors on the huge Bersimis project with several Eimco 105 Tractor-Excavators as the most efficient machines available for certain phases of the job.

Eimco 105's worked on-the penstocks at the powerhouse, loaded blasted rock at the diversion tunnel, mucked in the intake shafts, assisted in clean up of the main tunnel, loaded aggregate from the quarries and accomplished numerous other jobs including, (as shown above) the take-up of the bottom in the main tunnel.

The main tunnel bore at Bersimis is 7 miles long and excavated diameter was 45 feet. The intake shaft on the Diversion tunnel was 32 feet in diameter by 120 feet deep. The Bersimis project is scheduled to generate power by July or August of 1956.

Contractors have worked steadily in the face of adverse weather conditions to complete this great work at an early date. Eimco extends its heartiest congratulations to a job well done.

Eimco 105 Tractor-Excavators are at work throughout the world on Hydro-electric development projects, mines, roadbuilding, stockpile loading, pits and quarries and many other rough jobs. In many instances, the 105 is the only production equipment on the job—because its dependability is a well known and proven fact.

If your project calls for a tractor, bulldozer, or excavator, you'll want Eimco to supply you with full information about the versatile 105. Just send details of your project. You'll find, as have many others, that Eimcos will do the job faster, cheaper and better.

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 209



1. Like some other contractors, J. B. Michael & Co., Inc., Memphis, Tenn., uses a Jersey spreader to lay base material. A GMC dump truck feeds material to the spreader, which is pushed by a Cat D7 tractor.

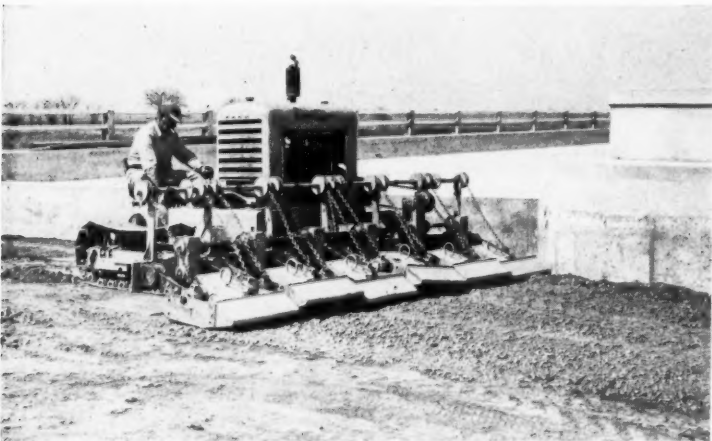
C&E Staff Photos



2. Water is applied uniformly over a wide area by a water tanker with a pressure applicator powered by a Fairbanks-Morse pump. An International truck pulls the tanker on the spread run by San-Ore Construction Co., McPherson, Kans.



5. On the section built by Broce Construction Co., Dodge City, Kans., base material is compacted by a Vibro-Plus vibratory roller powered by a Waukesha diesel engine. Some contractors used the same material for both base and subbase.



6. The ability of the International Vibro-Tamper to get into tight places like this made the equipment particularly useful on the project. The tamper's six heads cover a 12-foot swath as they compact base material adjacent to a bridge.



9. Aggregates, stockpiled 700 feet along the site of the J. B. Michael & Co. asphalt plant, background, are dozed to the plant. Sand is being unloaded by a Koehring 304 with Southern Machine Works bucket.



## Flexible paviojec

ffer

**South leg of Kansas pike is completed  
in one construction season as twelve contractors  
place 181 miles of base, bituminous pavement**

Construction of the Kansas Turnpike's flexible pavement, from Topeka southwesterly to the Oklahoma line this summer, provided a 131-mile-long parade of a number of types and models of compaction equipment, ranging from tractor-drawn sheepfoot rollers to the latest in self-propelled rubber-tire and vibrating compactors. Every one of the 12 paving contractors placing the bituminous pavement had at least one of the big 50-ton rubber-tire compactors working.

Particularly noticeable among the newer machines were the self-propelled rubber-tire rollers. Makers included Bros, Tampo, Welco, and Ferguson, and sizes ranged from the small 9-wheel models to the large 25-ton units. Most of the well known

makers were represented by the 50-ton rollers used on every job. Some of the rollers were towed from the drawbars of tractors ranging from Caterpillar D8's to Michigan 175A loaders. Many of the rollers were equipped with special yokes and were towed by rubber-tire tractors like the Cat DW20 and 21, Tournapull, and Heiliner.

Most of the motor grader spreads on the work were exclusively Caterpillar No. 12's, the big exception being the spread of Adams 660 graders used by Amis Construction Co., Oklahoma City, Okla. Most of the contractors spread the subbase and base materials with Jersey spreaders and tractors, but a few had Blaw-Knox self-propelled spreaders at work, and



10. At the end of the site is the Simplicity S-100 plant, which is fed with material from the Standard 50-ton 4-compartment bin, at right, that is equipped with calibrating reciprocating feeders.

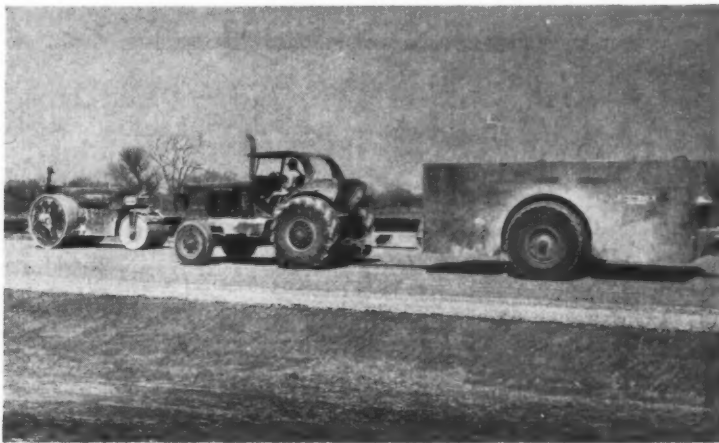
11. Gr...



3. With water added to the base, a Caterpillar No. 12 motor grader mixes the material before laying it out for both steel-wheel and rubber-tire compactors. The bridge, background, is a grade separation called TPU (Turnpike Under).



4. Subgrade compaction is attained by double Blaw-Knox sheepfoot rollers pulled by an International Farmall MD diesel on one spread. The Cat D8, background, pulls another pair of large-size sheepfoot tamping rollers.



7. An M-R-S tractor pulls the Ferguson 50-ton rubber-tire compactor that test-rolls the subgrade and each course of the subbase. Weak spots are broken up, remixed, and recompact.



8. A weak area showing up under the 50-ton roller is worked over by a Seaman Pulvi-Mixer. The material will be pulverized and brought to optimum moisture content before it is recompact.



11. Gravel is used as base by San-Ore, which operates another screening plant similar to this. Material dozed to traps goes to belt conveyors that dump to the Cedarapids screen atop the surge bin. Oversize, going to the adjacent bin, will be crushed and used as hot-mix aggregate.



12. A Barber-Greene finisher lays the asphaltic concrete binder on the road. The 24-foot roadway is being laid in three strips.

## Projects use different compactors

some simply dumped the material on the grade and spread it with motor graders.

There was a tremendous fleet of dump trucks of every description hauling on this leg of the turnpike, but some jobs were handicapped by shortages of these units. The shortage of trucks tended to make truckers more demanding: they preferred spreads where they could make the most money, they preferred jobs having the better haul roads, and they were influenced by the attitude of supervising personnel and other factors in taking on a job.

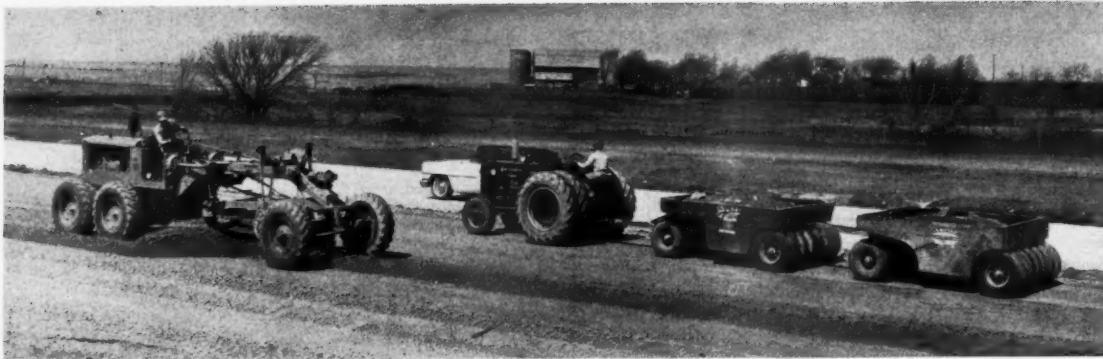
### Use crushed rock base

Though the placing of 18 inches of subbase and base started on a few

sections last fall, most of the work was done in the current construction season, the big parade of equipment starting in March. Bituminous paving got under way May 10, 1956, when Kaw Paving Co., Inc., Topeka, Kans., placed the first load of asphaltic concrete binder on a section just south of Topeka.

Some of the contractors found it more convenient and economical to build subbase and base with 18 inches of the same material—all of which had to meet base-course requirements—rather than putting down the 10 inches of subbase and 8 inches of base called for by plans and specifications. Some of the contractors used crushed rock for the base, others used gravel

(Continued on next page)



As the base material is laid out by a Cat No. 12 grader, it is given an initial compaction by a pair of Bros 13-wheel Wobble Wheel rollers pulled by an International tractor.

C&E Staff Photo



Thinking of an attachment for your Caterpillar machine?

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CAT\* attachments fill the bill every time. They increase operator comfort and convenience—which means increased efficiency. You get more work out of your machine.

See your Caterpillar Dealer's Parts Representative for information and catalogs on the complete line of Cat original attachments for your machines.

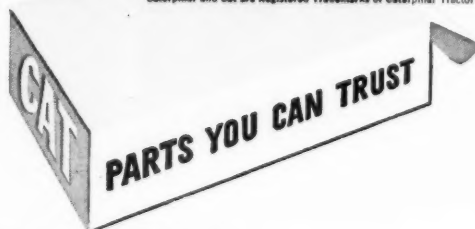
Caterpillar Tractor Co., Peoria, Illinois, U. S. A.



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For more facts, use Reader-Reply Card opposite page 18 and circle No. 210

(Continued from preceding page)

and still others used both.

A typical operation with crushed rock was done on a 25-mile section just southwest of Topeka by J. B. Michael & Co., Inc., Memphis, Tenn., which was supplied with material from a quarry and crushing plant near Eskridge, Kans., by Concrete Materials & Construction Co., Cedar Rapids, Iowa. (See "Stationary, portable crushers turn out aggregates for pike", page 26) Moran Trucking Co., Knoxville, Tenn., and W. A. Ramsey Trucking Co., Iuka, Miss., supplied the fleet of trucks needed to deliver the material to the project, which, including three paving contracts totaling more than \$4.5 million, was one of the largest bituminous paving jobs on the pike.

The first base or subbase course for each of the two roadways was started about 44 feet wide to provide for the 4-foot inside shoulder, 10-foot outside shoulder, 24-foot pavement, and slopes. This narrowed to about 38 feet as the base was completed. Shoulders, constructed of the same material as the base, were later given a bituminous surface treatment and cover stone.

Trucks hauling from the crushing plant dumped their loads into two Jersey spreaders, one powered by a Caterpillar D8 tractor and the other by a new D7. The subbase was spread in two layers, each planned to produce a 5-inch compacted lift, and the base was put down in two 4-inch compacted layers. Three water tankers with capacities ranging from 3,600 to 5,000 gallons wet the material to obtain optimum moisture content. All three were drawn by Ford trucks and equipped with Jaeger 2-inch pumps for pressure application of the water.

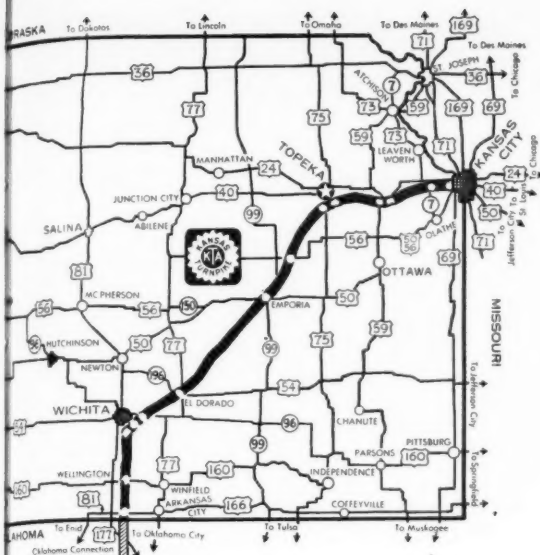
The optimum moisture content for this material was about 8 per cent, and the water trucks usually added about 4 per cent to moisture already contained in the rock so that the excess would compensate for some loss by evaporation during processing.

Three Caterpillar No. 12 motor graders followed the water wagons, mixing the material when necessary and shaping it to proper line and grade. An International tractor pulling two Bros Wobble Wheel 13-wheel rollers worked right with the motor graders to keep the surface tight for accurate blade work. Buffalo-Springfield 12-ton 3-wheel steel rollers compacted each course.

The subgrade and each course of the subbase and base were test-rolled by a Ferguson 50-ton rubber-tire roller pulled by an M-R-S-150 tractor. If any weak spots appeared under this roller, the area was broken up, remixed, and recompacted.

#### Use vibratory compactor

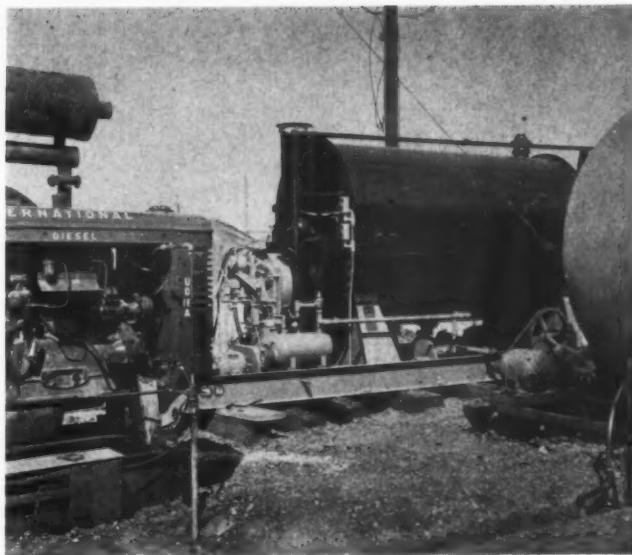
A slightly different spread was used by this contractor to obtain the same results near the north end of the section. Crushed rock for this portion of the project, produced and delivered by Weaver & Patton from a quarry north of Burlingame, Kans., was laid down by Jersey spreaders, mixed and shaped by Cat No 12 graders, watered



Route of Kansas Turnpike

Asphalt is heated at J. B. Michael's plant by the Cleaver-Brooks Peak-Temp oil booster, center. The International UD 18A, left, drives the dust collector. ▶

C&E Staff Photo



by three Ford 4,000-gallon water tankers, and rolled by a series of compactors. Two Bros 13-wheel Wobble Wheel rollers, a Gallion 12-ton three-wheel steel roller, and an International Vibro-Tamper provided compaction, while test rolling was done with a Bros 50-ton compactor pulled by an M-R-S 190 tractor.

Once the base course had cured out, it was primed with MC-1 cutback asphalt at a rate of 0.2 to 0.3 gallon per square yard. Two distributors primed the 30 to 31-foot width in two passes.

A Simplicity S-100 paving plant, with a 10 x 20-foot double-shell dryer and 5,000-pound pugmill, mixed the asphaltic concrete binder and surface-course material. Three International UD-18A diesel engines provided power to drive the dryer, pugmill, and dust collector. The 30,000-gallon asphalt storage tank was heated with hot oil from a Cleaver-Brooks Peak-Temp oil booster, and hot oil also heated asphalt pipelines, pumps, and weigh-bucket jackets.

#### Long narrow stockpiles

Because this plant was set up at one end of a long narrow site, stockpiles stretched more than 700 feet back to a railroad spur. Each stockpile was joined to the plant by a corridor, used by tractor dozers in pushing material to the cranes feeding the plant.

Materials were charged to a Standard 4-compartment bin equipped with calibrated reciprocating feeders that delivered the desired amount of each material to the boot of the cold elevator of the plant.

The three sizes of coarse aggregate and two types of sand were delivered to the site by rail. Some of the materials were unloaded and stockpiled by a Barber-Greene setup, others were unloaded by cranes with clams.

The asphaltic concrete was placed on the road by two Barber-Greene finishers and compacted by a Gallion 10-ton tandem roller, a Gallion 3-axle Roll-O-Matic, and two self-propelled rubber-tire rollers, one made by Browning Mfg. Co., the other by Bros.

#### Also use gravel base

Stabilized gravel, obtained from a pit near the job, provided subbase and base material for another typical

(Continued on next page)



**Now... a brand new, big capacity crane on rubber that can be moved over the highway!**

Easily stripped down... front and rear outrigger beams and boxes and rear counterweight are completely removable... this new, heavy-duty, highly mobile Lorain can quickly travel the highway from job to job.

It opens up new avenues of profits for busy contractors. Read some of its advantages below and make a date to have your nearby Thew-Lorain Distributor tell you the full story!

#### CARRIER FEATURES

- An entirely newly designed Carrier—28' 6" long, 122" wide—longer, heavier, stronger.
- Removable front and rear outrigger beams and boxes for road weight reduction.
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- Removable rear counterweight for road weight reduction.
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- Hydraulic Coupling—also Torque Converter Power Take-off.
- "Shear-Ball" mounting—no rollers, no center pin, no adjustments.
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- New, heavier duty hoist clutch, 2-piece design.

#### BOOM FEATURES

- Alloy steel, square-tubular-chord boom—lighter, stronger, more capacity... longer booms (up to 110 ft.).
- Pin-connections—easy, fast, simple. Boom may be folded for shorter travel length.
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- 14-ft. square-tubular-chord Mast Gantry.
- Booms with extra wide bases available for extra long boom service (up to 130 ft.—170 ft. with tip).

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 211



A Bros 9-wheel self-propelled roller compacts base material on the stretch built by McCarthy Improvement Co., Davenport, Iowa. It is working just ahead of the Cat No. 12 grader that brings the material to grade and shape.



As base material is shaped and compacted, it is watered by a 3,600-gallon water tanker pulled by a Ford truck. A Jaeger pump, mounted at the rear of the tank, is used if pressure distribution is desired.

(Continued from preceding page)

project, a 9-mile job done at Emporia by San-Ore Construction Co., McPherson, Kans. This pit operation produced a perfectly blended base material at a high rate of production, and oversize was used as hot-mix aggregate.

The pit was located adjacent to a branch of the Cottonwood River, a stream carrying a fluctuating volume of water. Since the gravel strata lay partly below normal water level, a dike had to be built along the river and pumps installed in the pit to keep it dry enough for operation. Three Gorman-Rupp 6-inch pumps were installed in sumps at separate locations, but only rarely was it necessary to operate all three.

Four Caterpillar D8 tractors with Cat 80 scrapers handled the job of stripping 16 to 18 feet of overburden to expose the 12-foot strata of good gravel. The first strippings were used in constructing the dike; the remainder of the material was wasted in portions of the pit where gravel had been removed. Scrapers were push-loaded by a D8 in the stripping operation, while another D8 with dozer maintained the fill.

Two screening plants were set up near the middle of the pit with conveyor belts extending out to both sides. Three Caterpillar D8 and two D7 tractor-dozers pushed the gravel up to traps, and Cedarapids 30-inch reciprocating feeders fed the 30-inch belts leading to the plants. The first belt sections used were 130 feet long, and additional 130-foot sections were added as the pit was expanded.

The conveyors deposited the gravel on two Cedarapids 4 x 12-foot double-deck screens mounted over the surge bins of the two identical plants. Minus 1½-inch material went directly from the screens to the surge bins that loaded trucks hauling to the road. Both plants were located side by side, permitting trucks to load at either one, eliminating the need for any truck to wait, and speeding up the entire loading operation.

Oversize material from the screening plant passed down a chute where the clay balls were removed by hand before the rock went into a surge bin. Trucks hauled from the surge bin to

## ALLISON TAKES ANOTHER LEAP IN POWER TRANSMISSIONS

*New "FourSpeed" Torqmatic Drive boosts performance, vastly increasing hauling ability both on and off the highway.*



Built for the big jobs — that's the story behind the new Allison "FourSpeed" TORQMATIC DRIVE.

With its 350 horsepower rating, this TORQMATIC Converter-Transmission team has the brawn and heft to take the biggest loads and toughest hills, like a breeze.

**The TORQMATIC Converter provides silken smoothness during starts and speed changes — the automatic lock-up drive provides big fuel savings during extended runs, and speeds hauling cycles on every road over any terrain.**

This quick-shift TORQMATIC Transmission has the driving ease that makes the biggest off-highway trucks and scrapers handle like a driver's dream come true.

And with the built-in TORQMATIC Brake (optional), it's got a big extra margin of safety.

Many leading manufacturers of scrapers and highway trucks are planning to install this "FourSpeed" TORQMATIC DRIVE to increase performance standards of their equipment.

And the reason for the tremendous interest in the newest of all TORQMATIC DRIVES is simple.

*It's the only heavy-duty converter-transmission team with an automatic lock-up drive, quick shift range selection and TORQMATIC Brake — one compact unit that is easy to install, free of troublesome piping and other miscellaneous accessories.*

For full details on the great new Allison "FourSpeed" TORQMATIC DRIVE in the equipment you buy or build, write Allison Division of General Motors, Box 894C, Indianapolis 6, Indiana.



Four Caterpillar D8 tractors and Cat 80 scrapers strip 16 to 18 feet of overburden at the San-Ore gravel pit to get at the 12-foot vein of gravel that produced an almost perfectly blended base material.

a nearby crushing plant, where 2 and 3-foot Symons-Nordberg cone crushers and a Symons screening plant crushed and screened the material for use as hot-mix aggregate.

A provision was made at the gravel plants for adding minus 40 sand to the gravel when necessary to control the PI. But materials were blended in the pit so carefully by the dozers that it was seldom necessary to use this equipment.

This gravel not only met the gradation and PI requirements for base material, but also contained the proper amount of moisture so that water did not have to be added on the road. The two plants had a capacity of 8,000 tons per day and actually produced between 5,000 and 6,000 tons per day when that much

could be hauled and spread on the road.

#### Place 10-inch lifts

On this project, a Jersey spreader and a new Caterpillar D7 tractor spread the material for a full 10-inch lift in one pass. This was then compacted by an International Vibro-Tamper together with several rubber-tire rollers. Two Ferguson 25-ton rubber-tire self-propelled rollers seemed to be doing an especially effective compaction job on these deep lifts. Welco 10-ton self-propelled and Tampo 8-ton self-propelled rubber-tire rollers were also being used. As usual, test rolling was done with Grace and Ferguson 50-ton compactors drawn by a Euclid wheel tractor and a Caterpillar D8. In addition to this equipment used on the compaction of the subbase and base courses, sheepsfoot rollers, Rome tandem disks, and other machinery were used to recompact the top 6 inches of subgrade to 100 per cent density.

For the hot-mix operations on this project, San-Ore used a Barber-Greene 848 continuous-mix plant and laid the material with Barber-Greene finishers. On another project at the south end of the turnpike, this same contractor used a Barber-Greene 6,000-pound batch plant.

#### Personnel

Supervising the work for J. B. Michael & Co., Inc., was project manager J. A. Hadley. He was assisted by assistant project manager C. E. Bain and paving superintendent T. J. Wilkinson. Felix Sherrod and Charles Johnson ran the crews laying base on the south and north sections of the project, respectively.

The San-Ore spread was under the supervision of R. A. Mauser, project manager. Plant superintendent was Jack Mauser, base superintendent was O. J. Smith, and paving superintendent was Lawrence Janke. Ed Heidebrecht looked after the subgrade-preparation operations.

Josef Sorkin, representing the firm of Howard, Needles, Tammen & Bergendoff, New York, N. Y., is consulting engineer on the entire Kansas Turnpike. Gale Moss is general manager of the Kansas Turnpike Authority.

THE END

#### Road study shows driver at fault in accidents

Statistics compiled by traffic and safety organizations, showing that drivers cause most of the accidents, have additional backing from a 4-year study made by the Vermont Department of Highways. Findings of the study, were made public last month.

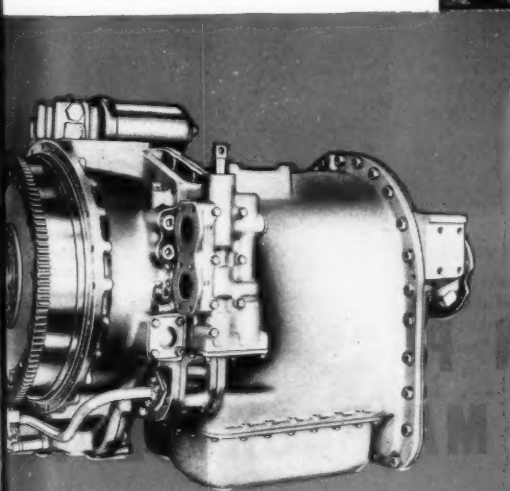
Careless drivers caused 41.7 per cent of the accidents. Unfit drivers—those drunk, tired, or emotionally upset—caused 37.5 per cent of the total.

Of the remainder of the accidents, 10.7 per cent were caused by pedestrians, 5.2 per cent by unsafe vehicles, 3.5 per cent by unsafe highways, 0.7 per cent by passengers, and 0.7 per cent by bicyclists.

—For more facts, circle No. 212

## EFFICIENT STEP PROGRESS

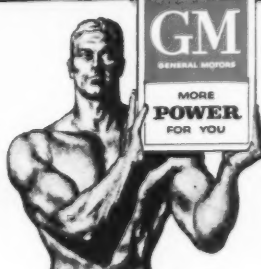
operating speeds,  
both up-hill and down

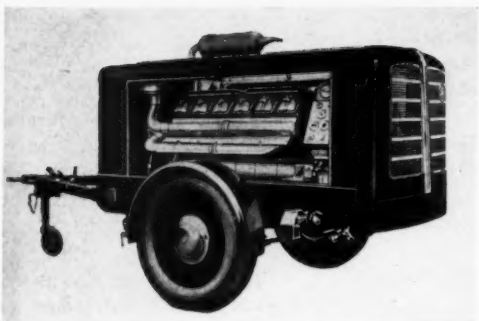


Model CBT-5640 Torqmatic Transmission  
Write for brochure.

# Allison

## TORQMATIC DRIVES





The D-901 diesel-powered, air-cooled, portable compressor available from Air Compressors, Inc., delivers 320 cfm.

### Imported compressors are air-cooled diesels

■ Diesel-driven, air-cooled portable compressors ranging in capacity from 55 to 320 cfm are available through Air Compressors, Inc. The compressors are manufactured by Irmer & Elze in West Germany. The compressor and drive units are integral, working on the same motor block and the same crankshaft, and lubricated by the same system in a common crankcase.

According to the company, the I&E compressors will operate at full efficiency in temperatures anywhere from minus 40 to plus 140 degrees F. Fuel is supplied to the firing cylinders by a Bosch inclined-type fuel pump operating without timing gears or other regulation. A spring-loaded safety valve is attached to the air receiver. In addition, a caged metallic blow-out disk is incorporated into the air receiver to operate if the safety valve fails to function.

The compressor is equipped with an electric starter and is mounted on a pair of pneumatic tires. An automatic unloading device operates at a predetermined pressure and may be regulated between 60 and 110 psi.

For further information write to Air Compressors, Inc., 2339 W. Beaver St., Jacksonville, Fla., or use the Request Card at page 18. Circle No. 10.

### Spanner wrenches fit most equipment work

■ Heavy-duty, adjustable spanner wrenches, which eliminate the need for a variety of fixed-size wrenches, are announced by the Owatonna Tool Co. Two types are available.

The CT-685 has a pair of interchangeable hooks, one  $\frac{3}{4}$  inches thick and the other  $\frac{5}{8}$  inches thick. The heavy-duty CT-686 has a single  $\frac{3}{4}$ -inch-thick hook.

Both wrenches have 11 adjustments and fit practically all work on tractors, road machines, power shovels, and other heavy-duty equipment, the manufacturer points out.

For further information write to the Owatonna Tool Co., 381 Cedar St., Owatonna, Minn., or use the Request Card at page 18. Circle No. 102.



Owatonna Tool Co.'s heavy-duty adjustable spanner wrench.

Plasti-Grip is spliced in minutes with a hot iron.

### Plastic material serves as joint or waterstop

■ Progress Unlimited, Inc., has introduced Plasti-Grip, a 3-in-1 joint made of extruded plastic (poly-vinyl-chloride) that can be used as an expansion joint, as a construction joint, or as a waterstop.

The material comes in continuous strips 100 feet long and 5 or 6 inches wide. It can be cut with a knife and



spliced on the job with a hot iron in minutes, according to the manufacturer.

Plasti-Grip's deep grooves are said



Heaping load on the bulldozer is easily handled by the Turbocharged D9. Notice all-around visibility from operator's seat—also easy access to controls.

## D9 SETS PRODUCTION PACE CROSSING PEABODY TURNPIKE ON SECTION 33, MASSACHUSETTS

A bid of \$4,719,719 on Section 33, Massachusetts Turnpike, won the contract for J. F. White Contr. Co., Cambridge, and Consolidated Constr. Co., Attleboro, Mass. Among other work, specifications on this 3.89-mile section called for excavating 1,720,000 cu. yd. of earth, 46,100 of rock and 231,800 of peat, as well as handling 507,800 cu. yd. of borrow and 205,000 of gravel.

In the equipment line-up, there was a fleet of Caterpillar units including a D9, four D8s, two No. 90s, one D6, four DW21s, a No. 12, a No. 212, a D337 and two D13000s in draglines. Here you see the Turbocharged CAT\* D9 Tractor with No. 9S load-shape Bulldozer pushing fill into a peat bog.

On this well-planned operation, seven scrapers hauled the fill to the D9. Making round trips of about 4500 feet, the wheel-type DW21-No. 21 Scrapers averaged 15.4 pay yards a trip. On shorter hauls, the crawler-drawn No. 90s averaged 22 pay yards a trip. During its

10-hour day, the D9 set such a fast pace for the scrapers that only occasionally was it necessary to have another 'dozer lend a hand with the fill.

For jobs that call for top production, you can't beat the dirt-moving capacity of the giant D9. For complete facts about the new king of the crawlers, see your nearby Caterpillar Dealer!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

# CATERPILLAR

\*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

THE D9—NEW KING OF THE CRAWLERS

Almost a scrapers

to grip the concrete better than flat or dumbbell-type joints, and its exclusive reinforced U-shaped center pleat expands and contracts with the joint. It is designed to give the most effective joint between two pours of concrete.

The material reportedly will resist water pressures up to 125 feet head, stays flexible even in extreme low temperatures, is alkali and acid-resistant, and has virtually unlimited life.

For further information write to Progress Unlimited, Inc., 15 W. 44th St., New York 36, N. Y., or use the Request Card at page 18. Circle No. 113.

## Pole-setting combination operates hydraulically

■ A pole-setting combination, consisting of a derrick and a digging auger, is announced by Tel-E-Lect Products, Inc. The attachment is designed for both front and rear operation from a truck.

A single, double-acting hydraulic cylinder operates the derrick. The digger can be attached directly to the derrick or suspended from a winch line. The derrick legs are securely and automatically anchored to the truck frame, the company reports.

A mechanical digger can also be used with the derrick. It is coupled to the power source by means of a telescopic drive shaft and a self-locking universal joint.

The combination is offered in three sizes to handle poles up to 55 feet long. The hydraulic equipment is designed to prevent overloading during any step of the digging or pole-setting operation, according to the firm.

For further information write to Tel-E-Lect Products, Inc., 10093 Minnetonka Blvd., Minneapolis 26, Minn., or use the Request Card at page 18. Circle No. 169.



## Warning barricade has integral caution lights

■ A warning barricade with flashing amber lights and red reflectors is available from the Safe-T-Flare Corp. The 3-foot-long barricade is made of heavy-gage, bonderized steel with either the word "Caution" or "Open Trench" imprinted.

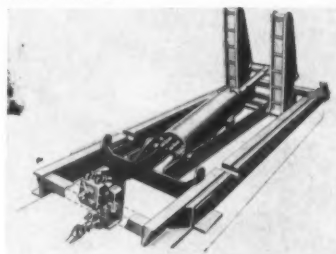
A pair of neon lamps with lenses on both sides provide flashing warnings in both directions. In addition, four reflectors give added protection. The barricade is available from the manufacturer on a per-day rental basis.

The barricade is reported to operate 90 days, around the clock, on a standard 6-volt battery. The barricade, lights, battery, and all operating parts are supplied and maintained by the manufacturer.

For further information write to the Safe-T-Flare Corp., 2005 Armour Road, North Kansas City 49, Mo., or use the Request Card at page 18. Circle No. 168.

## Improvements strengthen underbody dump hoists

■ Several design improvements in the Models 7 and 8 underbody hoists, said to increase hoist strength and resistance to deflection under full load, have been announced by the Hercules Steel Products Co. The two models, used with 10 to 13-foot Hercules dump bodies, have lifting capacities of from 11 to 14 tons.



The Hercules Model 8 hoist.

The hoist underframe has been stiffened by the addition of a formed-steel, boxed, outer member running from the forward mounting angles back to the body hinges on both sides of the underframe.

The hoist-cylinder mounting has been reversed and the cylinder base now mounts in the V of the channel. A heavier channel cross section and the addition of welded side-plates at the pin holes add strength and durability to the cylinder mounting, the manufacturer says. Thicker straight tension bars have also been added.

For further information write to Hercules Steel Products Co., Galion, Ohio, or use the Request Card at page 18. Circle No. 120.

←For more facts, circle No. 213

## BIG PRODUCTION FEATURES OF THE D9

### First Track-Type Tractor with Turbocharger

The D9's Turbocharger is driven by engine exhaust, utilizing energy which would otherwise be lost. It packs air into the engine according to engine load, not engine speed, for more working horsepower.

### Choice of Torque Converter or Direct Drive

To match the tractor to your job, two types of drive are available: the exclusive Caterpillar Oil Clutch with six-speed transmission (both in forward and reverse) or a three-stage torque converter with three gear ranges.

### Completely New 320 HP Engine

The powerful D9 Engine features, in addition to the Turbocharger, a 6 1/4" bore and 8" stroke and runs at 1240 RPM.

### Constant Power Drive for Rear-Mounted Equipment

Power for cable controls, direct from the engine's rear power take-off, makes operation completely independent of flywheel clutch or torque converter, boosts operating efficiency.

### Easy to Operate

Hydraulic boosters provide power for steering and braking and master clutch operation. The 7-roller track frame provides excellent stability, flotation and ride. The starting engine has an electric starting system and simple single-lever control for easy and convenient operation from the seat. Fast, sure starts in any weather.

### Easy to Service

Oil clutch, torque converter, transmission and steering clutches can each be removed individually without disturbing other components. Hydraulic track adjusters are among the many other features for fast, easy adjustment.

## NG PEAT BOG TS TURNPIKE

Almost singlehanded, the D9 handles all the fill brought up by seven scrapers on Section 33, Massachusetts Turnpike, near Framingham.



Back of the D9, a dragline powered by a Cat D337 Engine scoops peat from bog.



## Names in the news



John E. Wiley, new managing director of the materials and supplies division of the ARBA.

### ARBA expands staff

In order to increase its services to the highway industry, the American

W. Guy Gunn, new field director of the ARBA.



Road Builders' Association has expanded its contractors division by the enlargement of the materials and supplies division.

John E. Wiley, assistant executive secretary of the American Association of State Highway Officials and editor of "American Highways", the official AASHO publication, has been named director of the expanded materials and supplies division. He has also

been associated with the Wyoming State Highway Department. In his new capacity, he will be responsible for anticipating soft spots in production and supply and will direct the ARBA Task Force reporting on the capacity of this segment of the industry.

W. Guy Gunn of Houston, Texas, has been appointed as field director of the contractors division. He had been manager of the public works department of the Houston Chamber of Commerce. He will be in charge of directing a membership-extension program that will emphasize organizing additional state affiliations within the division.

The materials and supplies division is potentially one of the largest units of the ARBA.

### United Engineers names new personnel director

Arthur C. Eckerman has been named to fill the newly-created post of director of personnel for the United Engineers & Constructors, Inc. To be responsible for the formation of the



The director of personnel for United Engineers & Constructors, Inc., Arthur C. Eckerman.

personnel department which he will direct, Eckerman had been associated with Pioneer Service & Engineering Co. prior to his present appointment.

He has also served on the faculties of Baylor University, Waco, Texas; Purdue University, Lafayette, Ind.; and Northwestern University, Chicago, Ill., as an instructor in personnel administration, organizational planning, management development, and labor economics.

### F. H. McGraw appoints two

The F. H. McGraw & Co., New York, N. Y., engineering and building firm, has appointed George Basil Blonsky to the position of project engineer for a \$25 million fertilizer plant the firm is building in Korea. A specialist in metallurgical and chemical operations, Blonsky will make his headquarters in New York.

The firm has also named R. L. Senior to the post of construction manager. He is a veteran of 44 years in the construction industry. Immediately prior to joining McGraw, he had been operations manager on a billion-dollar atomic plant built by Peter Kiewit Sons' Co.

### W. E. Hawkins retires from state highway post

The state construction engineer of North Carolina, W. E. Hawkins has retired from the position after 15 years' service. With the highway department since 1921, Hawkins also served as state maintenance engineer and as engineer of tests and materials. Prior to joining the North Carolina department, he had been associated with the State Roads Commission of Maryland.

Hunter D. Irving, division engineer at Durham, will succeed Hawkins. Irving's position will be filled by Earl Crump, highway personnel director.

### Ohio bridge division names chief engineer

D. Henry Overman has been appointed to the position of chief engineer of the Bureau of Bridges of the Ohio Department of Highways. He replaces Richard Orth.

With the Bureau of Bridges for 31 years, Overman served as executive officer of the 30th U. S. Naval Construction Battalion in Trinidad, Pearl Harbor, and the Philippine Islands during World War II.

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**vs COMPETITIVE BRANDS\***

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AVERAGE COMPETITIVE	.259
GENERAL LCM NYGEN	.224

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PER TIRE PER HOUR \$... .03½

PER HOUR 10-TIRE TRUCK \$... 0.35

ONE TRUCK 10-HOUR DAY \$... 3.50

ONE TRUCK 200 DAY YEAR \$... 700.00

50 TRUCKS-200 DAY YEAR \$35,000.00

*\*FROM ACTUAL SERVICE RECORDS*







**THE GENERAL TRUCK TIRE**

**THE GENERAL TIRE & RUBBER COMPANY • Akron, Ohio**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 214

### Calci names

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SEPTEMBER



Gordon K. Owen, newly assigned field engineer for the Calcium Chloride Institute.

### Calcium Chloride group names field engineer

The Calcium Chloride Institute has appointed Gordon K. Owen as a field engineer covering Indiana, Ohio, Kentucky, and Tennessee. He will make his headquarters in Lexington, Ky.

### Army engineer officers awarded Legion of Honor

Two officers of the U. S. Army Corps of Engineers, Brig. Gen. Walter K. Wilson, Jr., and Col. Gunnard W. Carlson, have been awarded the Legion of Honor by the Republic of France. Both awards were conferred for services and cooperation given to the French authorities in Morocco.

Gen. Wilson has been named an officer of the Legion and Col. Carlson, a chevalier. Wilson is now assistant chief of military construction, and Carlson is resident member of the board of engineers for Rivers and Harbors.

The Corps has assigned Col. John L. Person to the post of acting assistant chief of engineers for civil works in the office of the chief of engineers. He had been division engineer of the Ohio River Division.

Col. Rudolph E. Smyser will succeed Person in the Ohio post.

### Perlite Institute counsel

The Perlite Institute, trade association of producers of perlite, a lightweight building aggregate, has appointed Asher B. Etkes, of New York, N. Y., as a public relations counsel for the association.

### Pennsylvania to add more roadside rests

The Pennsylvania Department of Highways has acquired land for the construction of 13 new roadside rests, bringing to 42 the number in operation throughout the state. All the areas have facilities for cooking and eating. Sanitary facilities are provided, and pure drinking water is available from state-tested wells. The facilities will be available only to non-commercial vehicles.

The highway department is also studying the aspects of constructing a 46-mile link between the New York Thruway and the proposed Ohio Turnpike extension in Erie County.

### Pipe group names head

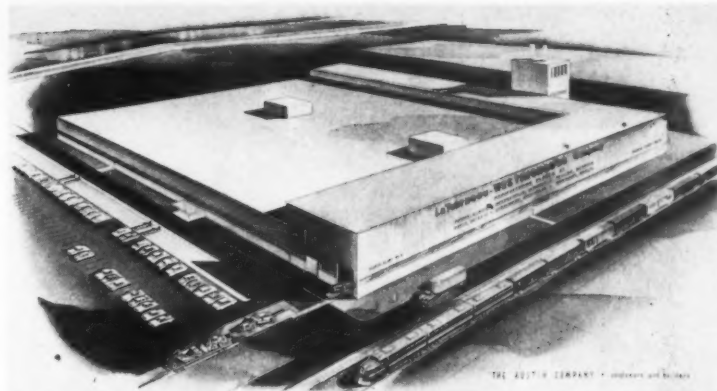
The Corrugated Metal Pipe Association, composed of the State Corrugated Metal Pipe Associations of seven states, is being managed by Milo P. Flickinger.

An architect's conception of the LeTourneau-Westinghouse factory to be built in Peoria, Ill.

### LeTourneau-Westinghouse plans plant expansion

A \$9,000,000 building and tooling program, scheduled for completion by April, 1957, is being planned by the LeTourneau-Westinghouse Co., Peoria, Ill. The major part of the program will be concerned with the construction of a 300,000-square-foot factory and adjoining one of the present Peoria plants.

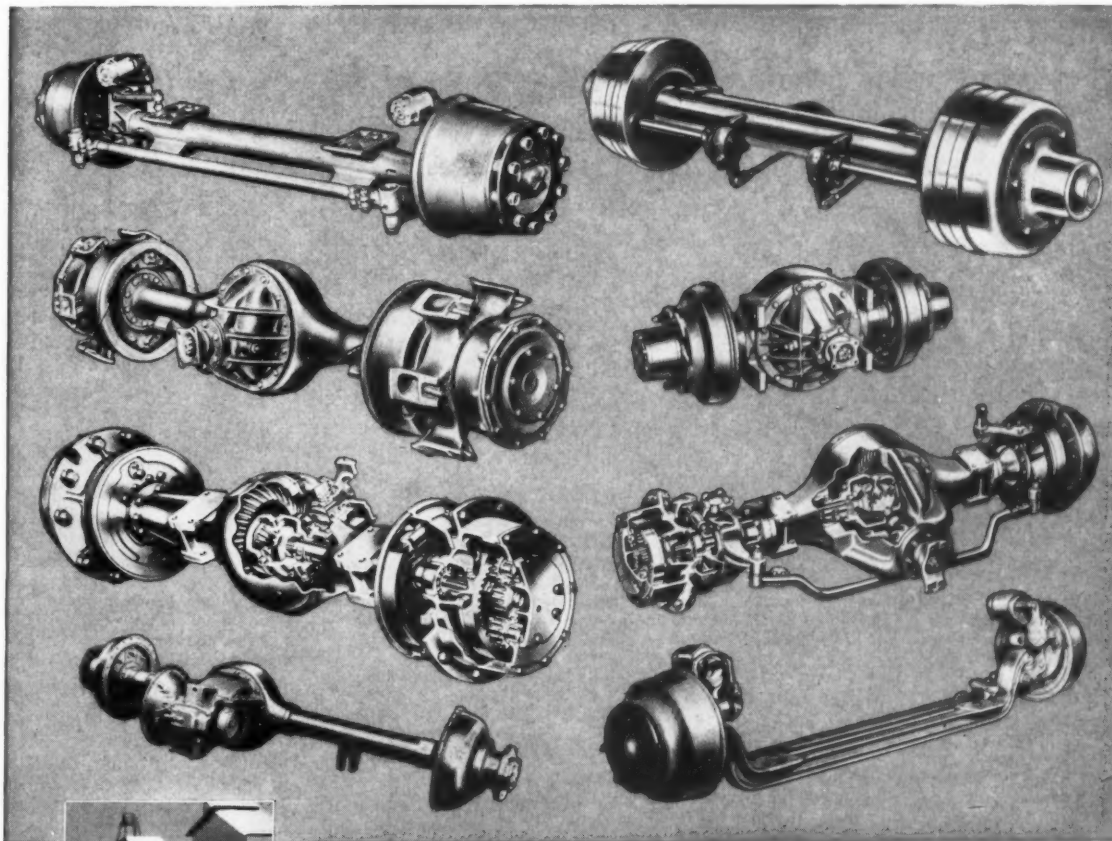
The new building will be approximately 500 feet wide and 600 feet long and will contain complete manu-



facturing facilities for processing rubber-tire earthmover prime movers. Of tilt-wall construction, the structure will have two floors, which will house first-aid rooms, shop offices,

dressing rooms, and locker rooms, in addition to the manufacturing space.

The firm also plans to expand its plant operations at Toccoa, Ga., and Indianapolis, Ind.



## A flattering thing to say for any working vehicle **CLARK AXLES!**

Champions, they say—athletes or revenue vehicles—are as young as their legs; which explains quickly why Clark-equipped vehicles grow old profitably—their "legs" stay young.

Clark builds axles for every type of commercial vehicle

- trucks and buses—rugged, easy-to-steer front axles; driving axles, steering and non-steering
- trailers—light, rigid, tough axles of high carbon steel tubing; spindles forged integral
- off-highway vehicles—specially designed heavy-duty drive axles, steering and non-steering, for industrial machines;

axle-transmission drive units for agricultural and industrial applications

- fork-lift trucks—axles designed for materials handling equipment
- housing—light, exceedingly strong, one-piece forging, heat-treated

What is your need in that vital area of "durable legs?" In Clark axles you get the solid cash benefits of 50 years concentration on transmitting horsepower to wheels: efficiently, economically, durably.

A handy-sized Clark Products book is yours on request; indicates several reasons why leading manufacturers find it good business to do business with CLARK.

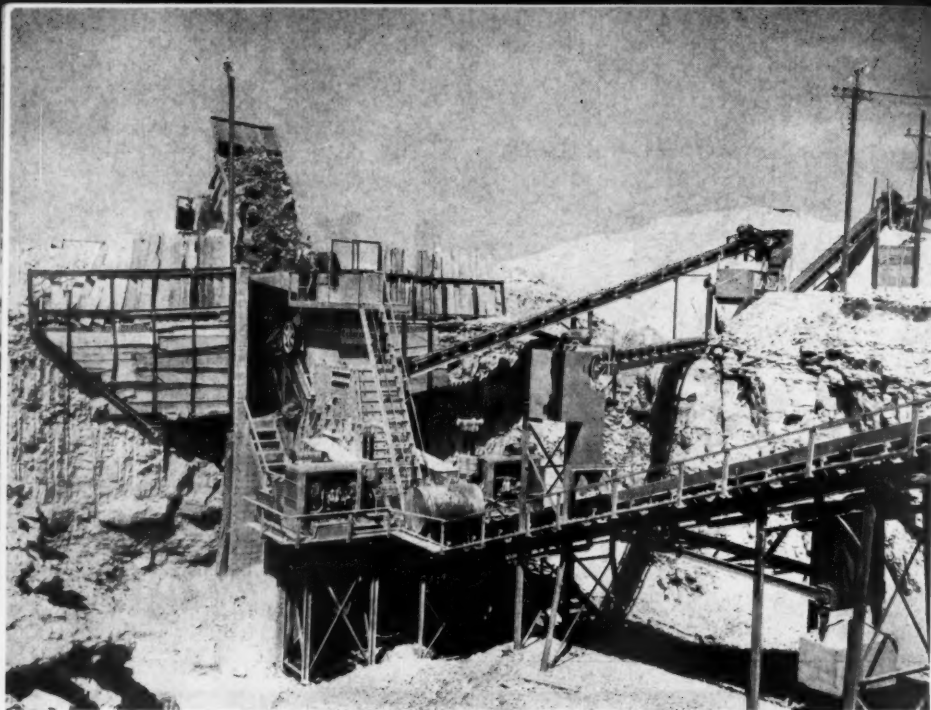
**CLARK EQUIPMENT COMPANY, Buchanan, Michigan**

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BUSES and OFF-HIGHWAY EQUIPMENT.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 215

# CLARK® EQUIPMENT





1. The plant of Concrete Materials & Construction Co., Cedar Rapids, Iowa, is fed by a Euclid end-dump, material going to a 4-inch grizzly. Retained material goes to the Cedarapids 53 x 60 double-impeller impact breaker driven by two GM 110-series diesels.

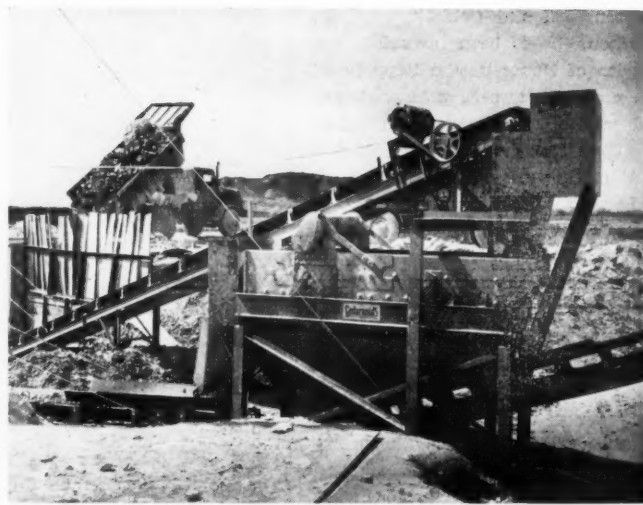
C&E Staff Photos

## Stationary, portable crushers turn out aggregates for pike

Total of 7 million yards  
of material is produced;  
base and subbase alone  
require 5.5 million yards



2. Material from the primary crusher, at left, goes to this surge bin, which feeds the belt leading to the second stage. The stacker conveyor, background, stockpiles finished material which is being turned out for J. B. Michael & Co., Inc., Memphis, Tenn.



3. Minus 4-inch material from the grizzly goes to this Cedarapids 4 x 12-foot double-deck vibrating screen, where minus 1 1/4-inch material is taken out by conveyor.



4. At the second-stage tower, rock flow is divided in half, then in quarters. Triple-deck vibrating screens, 4 x 14 feet, remove minus 1/2-inch rock and separate 1/2 to 1 1/4-inch material for stockpiling. Larger rock is returned to four hammermills arranged in closed circuit with the main feed belt to the second stage.



5. A Michigan 175A loader fills the dump box of a GMC tandem-axle truck with material that has been stockpiled during a period when not enough trucks were available to carry away production of the crusher.

Quarry blasting, shovels, crushing and screening operations, and a flow of trucks made a noisy trail from Kansas City west to Topeka, then southwest through Emporia and Wichita to the Oklahoma line as the Kansas Turnpike was paved from March through this summer.

Practically every commercial aggregate producer within a reasonable haul distance of the pike worked at full production, clawing more than 7 million cubic yards of sand, gravel, and rock from the earth for the new superhighway. If these producers were unable to fill orders for some of the 5.5 million cubic yards of base and subbase and 1.5 million cubic yards of gravel for both concrete and bituminous pavements, gravel-producing or rock crushing operations were set up by, or for, the contractors.

Concrete paving totals 110 miles of 24-foot-wide 10-inch-thick slab, which rests on a 4-inch crushed stone and 1-inch sand cushion base. This stretch is shouldered with crushed-stone mat penetration shoulders 10 feet wide on one side and 4 feet wide on the other. The flexible pavement, stretching 181 miles from Topeka southwest to the Oklahoma line, consists of 18 inches of crushed stone or gravel base and subbase, from 38 to 44 feet wide, with

CONTRACTORS AND ENGINEERS

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a 24-foot roadway consisting of 4 inches of hot-mixed asphaltic concrete binder and surfacing. This particular stretch has mat penetration-treated shoulders.

Material for the base, subbase, concrete, and shoulders was produced by virtually any setups available to the contractors. Typical—and yet in contrast to each other—were two setups working this summer, one of them producing concrete aggregates, the other turning out base and subbase material. The former plant consisted almost entirely of portable units, all of a size and weight so that they could be moved over Iowa highways. The plant producing base and subbase was almost entirely non-portable. Everything—from the big shovels in the pit through all crushing and screening stages—was of a type that had to be partially or completely dismantled for a move.

#### Large crusher turns out base

The big stationary plant was a Cedarapids 1,000-ton-per-hour unit of Concrete Materials & Construction Co., Cedar Rapids, Iowa, which was located near Eskridge, Kans., producing base and subbase material for J. B. Michael & Co., Inc., Memphis, Tenn. This firm held three paving contracts for a 25-mile section southwest of Topeka, that required more than a million tons of crushed rock base and subbase.

The basic element of the Cedarapids plant was a 53×60-inch double-impeller impact breaker powered by two General Motors 110-diesel engines. Standing taller than a three-story building, the unit was set in a deep excavation in the rock. Haul units dumped quarry material into

the primary apron feeder approximately from ground level; no appreciable ramp was needed.

Material passing the impact breaker was split to four hammermills in the secondary units of the plant, where the minus 1¼-inch base material was produced. Like most other contractors on the pike, Michael & Co. used the same material for both base and subbase for reasons of economy, although the specifications permitted a subbase material with less load-carrying capacity.

The Concrete Materials & Construction Co. quarry, adjacent to the plant setup, was unopened until this job started. Stripping of 2 to 12 feet of earth and poor rock to expose suitable rock, done by shovels and Euclid end-dumps, continued even after the quarry was in operation so that a plentiful supply of rock was always exposed.

Powered by two Gardner-Denver 600-cfm rotary compressors, and using Timken and Brunner & Lay carbide insert bits, three Gardner-Denver DH123 wagon drills put 3½-inch blast holes down through the 20-foot ledge of good limestone.

Holes were loaded with Atlas Gelodyn No. 1 and Amodyn No. 2 in 3-inch × 4 1/6-pound cans and detonated with Atlas Rockmaster caps using delays from 1 to 6 milliseconds. Individual shots ranged from 15,000 to 20,000 tons per shot, and production averaged 4 tons per pound of explosive.

Four shovels loaded the blasted rock into the fleet of five Euclid end-dumps and four Allis-Chalmers TS-200 rock wagons, that hauled to the feeder of the primary crushing unit.

(Continued on next page)



**"My LORAIN-Dixie Hoe  
sure moves a lot of  
dirt for its size..."**

reports

**D. L. MATTHEWS**

Fayetteville, N. C.



A wide variety of scattered jobs . . . lots of them . . . many fast moves . . . that's the work schedule of many contractors like D. L. Matthews. Above, his ¾-yd. Lorain-Dixie is equipped with a 13-ft., 10-in. long hoe boom and 24-in. wide hoe bucket, digging 900 ft. of 5 to 8 ft. deep trench on a housing project. Below, it has been converted to a 6-ton crane to set 8-ft. sections of 42-in. concrete pipe, each joint weighing 5600 lbs. For any kind of work, a Lorain-Dixie is a sure money-maker even the smallest contractor can afford . . . yet the biggest contractor has a place for a machine of this size in his fleet, too.

Lorain-Dixies make "dirt fly" for a number of good reasons. There's rubber-tire mobility to move fast and often. Then, there's a long list of quality design features that you would hardly expect to find in a dirtmover of its size and price. Here are a few: clean-cut, simple design — easy to service, squatly, low center of gravity — no bounce, no rock,

5 interchangeable hydraulic clutches, separate oil reservoir and independent system for each clutch, all spur gears are machine cut, all horizontal power shafts on anti-friction bearings, economical operation — uses only one gallon of fuel per hour. Completely convertible to shovel, crane, clamshell, dragline or hoe.

Check all of the Lorain-Dixie features . . . and then check the low cost. You'll see why it's the best dollar value in the ¾-yd. shovel — 6-ton crane class. Your Thew-Lorain Distributor can give you literature, facts and figures!

**THE THEW SHOVEL CO.**  
Lorain, Ohio



**THEW  
LORAIN**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 217

## VULCAN Pile Extractors Pull Toughest Piles

Specialized power for pulling the heaviest, longest, and most difficult steel, concrete, and wood piling. Simple, durable, efficient. Only one moving part . . . requires no assembly or adjustment . . . can't get out of order.

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Processed base material moves from the Cedarapids surge bin and loading conveyor, left, to a Euclid hauling to the stockpile at the blending plant. The Koehring Dumptor is used by Anderson to take waste from another conveyor and dump it in an excavated portion of the quarry. C&E Staff Photos

(Continued from preceding page)

#### Crush large rock

Rock dumped to the 50-inch apron feeder was carried to a 53-inch x 3-foot grizzly with 4-inch openings. The minus 4-inch material falling through the grizzly was conveyed to a Cedarapids 48-inch x 12-foot double-deck screen that removed minus 1 1/4-inch material. This fraction, which contained some good rock and most of the clay and dirt from the quarry, was conveyed directly to a separate stockpile and deposited by an Iowa portable stacker conveyor. The material in the 1 1/4 to 4-inch range bypassed the impact breaker and was deposited on the main feed belt leading to the second stage surge hopper.

The rock retained on the 4-inch grizzly was fed directly into the big impact breaker, where the twin impellers did an effective job of reducing the stone without creating a large volume of fines. This big crusher seemed to swallow up the 12 to 22-yard loads of rock as fast as the haul units backed up and dumped into the feeder.

A 42-inch conveyor powered by a GM 6-71 engine carried the rock from the impact breaker to the 60-ton second-stage surge bin. Another 42-inch belt carried the rock from this bin to the top of the tower of the second stage unit. An arrangement of hoppers with splitting gates divided the flow of rock into four approximately equal volumes.

Each of these portions was fed to a Cedarapids triple-deck 48-inch x 14-foot vibrating screen, where the minus 1/2-inch material was removed and stockpiled for use as agricultural lime. The remaining minus 1 1/4-inch rock went to the finished-material stockpiles. The oversize on each line passed to a Cedarapids 4033 hammer-mill that crushed the material and returned it to the second-stage feed belt, thus closing the circuit. Each of the four hammermills was powered by a GM 110 engine.

The finished material was conveyed to a big radial stacker conveyor with a 36-inch x 85-foot inclined conveyor. This big stacker, designed by Iowa Mfg. Co. and assembled in the contractor's shops, rotated through an arc of almost 180 degrees as it built a stockpile with a capacity of 25,000 tons. During most of the season, this plant setup ran 24 hours a day, 7 days a week.

Recovery was made by three 36-

**No other  
Compacting  
Equipment  
approaches  
the Time and  
Money-Saving  
On-the-job  
Adaptability  
of the Jackson  
VIBRATORY  
MULTIPLE  
COMPACTOR!**

**JACKSON VIBRATORS, INC.**

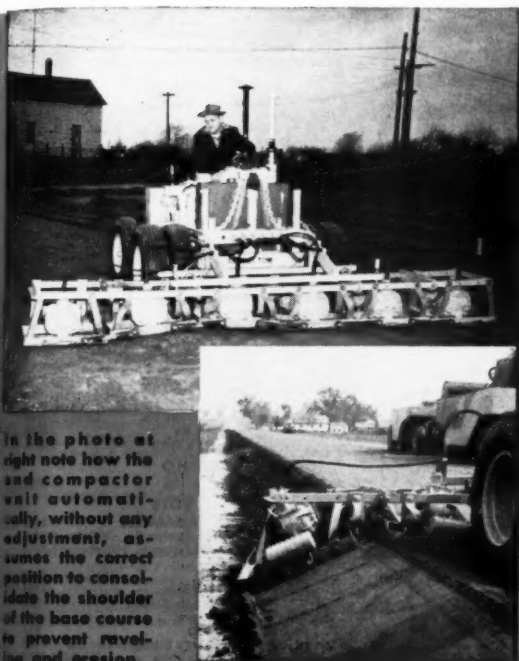
It is the only compactor having in its workhead 6 independent compactor units which can be individually as well as simultaneously operated. It is the only compactor in which the compactor units may be grouped and regrouped on the job to ideally fit each and every compaction project (see illustrations). Standard width 13'3". This extraordinary flexibility is a tremendous time and money-saver. It provides perfect coverage with no lost motion and makes it possible to get into places with the JACKSON that other equipment can not touch. Any individual unit may be detached and fitted with a furnished operating handle to convert it to the identical and very popular manually-guided self-propelled Jackson Compactor, so widely used on a multitude of small jobs for perfect consolidation in places inaccessible to other equipment.

**EACH OF THE COMPACTING UNITS IN THE JACKSON MULTIPLE COMPACTOR DELIVERS UP TO 4200 TON BLOWS PER MINUTE.** Hence specified densities are quickly achieved in granular soil bases, sub-bases and all materials normally used in macadam base and pavement widening projects, large fills and similar jobs.

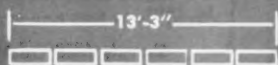
The Jackson Multiple Compactor is by long odds the handiest, most convenient and efficient compacting machine on the market today. It will save you many many times its cost in both time and money. See it at your nearby distributor. Hear name and literature on request.

**LUDINGTON, MICHIGAN**

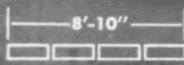
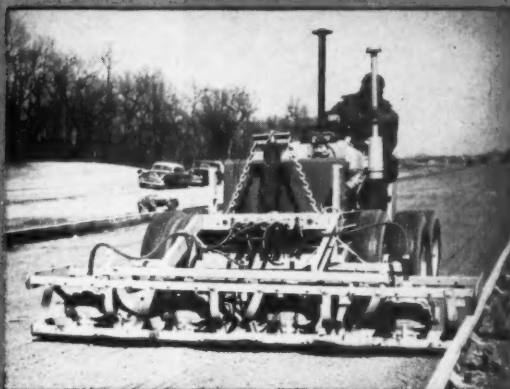
An Iowa portable stacker stockpiles minus 1¼-inch waste that contains some good rock and most of the clay and dirt from the quarry. Some of it is loaded to an Allis-Chalmers rock wagon, background, by a Cat D6 Traxcavator, for use on service roads in the quarry and plant area.



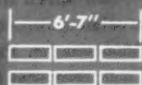
In the photo at right note how the stacker and compactor unit automatically, without any adjustment, assumes the correct position to consolidate the shoulder of the base course to prevent raveling and erosion.



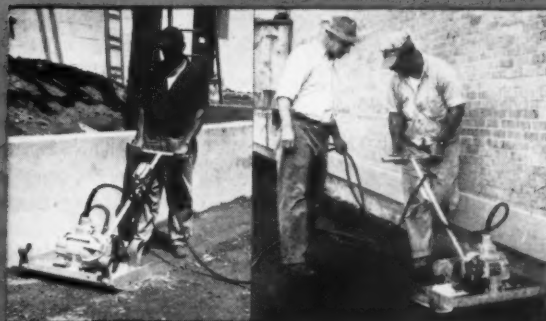
Utilizing the 6 Compacting units in line for maximum width (13'3") coverage. Working speeds: 0 to 60 ft. per min. Reverse: 5½ miles per hour.



In this application the number of compactor units has been reduced to 4.



"Three following three" tandem arrangement of compactor units ahead of tractor, for maximum, one-pass consolidation of granular base course.



Furnished with operating handles, single compacting units may be used for jobs like these: Left: Consolidating gravel back-fill adjacent to parking lot retaining wall. Right: Consolidating bituminous concrete pavement up close against building wall — not accessible with other equipment. Unit compactor bases supplied from 12" to 26" in width.



This arrangement was adopted for the 4" to 5" bottom course of a 24' soil-cement paving project. Variable in width within limits.



Towed at the side, this arrangement of compactor units provides perfect, one-pass consolidation of widening course. Variable in width within limits.

inch x 75-foot conveyors installed in tunnels under the stockpile. Each of these conveyors was capable of loading trucks at a rate of 1,000 tons per hour, but the trucks, at a premium along the turnpike route, were not always available to haul material away. During periods when rock was being produced at a faster rate than it was being hauled out, one or more of the Allis-Chalmers TS-200 rock wagons were set to work building auxiliary stockpiles. Then, when trucks became available, they were loaded from these stockpiles by a Michigan 175A loader with a 3-cubic yard bucket.

Most of the major plant units were powered by independent GM diesel engines, though the stacker and recovery conveyors and some of the other units were operated electrically on power supplied by two GM 150-kva generator sets powered by GM 110-diesel engines.

With the plant running at capacity, these engines burned, every 36 hours, enough fuel to fill a 4,500-gallon transport. The job of distributing fuel to the many diesel engines scattered throughout the project was handled almost effortlessly. A 12,000-gallon steel tank was set high on a mound of strippings so that fuel flowed from it to all but one engine by gravity, eliminating the need for refueling engines individually. Only the engine at the top of the second stage tower was not fueled in this way.

#### Portable plant units

Unlike the Concrete Materials & Construction Co. plant, the setup of B. L. Anderson Inc., Cedar Rapids, Iowa, was almost completely portable.

Anderson's plant, located near Lawrence, produced material for Tecon Paving Co., Dallas, Texas, the general contractor for about 23 miles of paving in the Lawrence vicinity. This section consisted of concrete paving on crushed-stone base, and crushed-stone shoulders.

The quarry, atop a high bank at the edge of the Kansas River's flood plain, had been worked to a limited extent, but this operation was of little benefit to the current project.

Using a pair of Caterpillar D8 tractors with Cat 80 scrapers, the contractor stripped about 10 feet of soil and an equal amount of shale to get to the 19-foot ledge of usable rock. The scrapers carried stripped material to a waste area beyond the range of quarrying operations. Unsuitable rock was then stripped by one or

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(Continued from preceding page)

more of the ¾-yard shovels on the job, loaded into Euclid end-dumps, and hauled to waste areas. Of the eight shovels used, five were Bucyrus-Erie 22-B's, and three were Lima Paymasters.

After three Bucyrus-Erie 22-T drills dug the series of 6-inch blast holes through the 19 feet of rock, the holes were loaded with Du Pont Nitromon and Nitromax in 5-inch cans each containing 24 pounds of explosive. Average shots delivered about 2½ tons of rock per pound of explosive.

Both drilling and shooting were carefully done so that a shallow layer of good rock was left to form a smooth and flat floor, since the soft shale under this layer would have become slippery and muddy if it were exposed to rain.

### Shovels feed crushing plants

Three complete Cedarapids crushing and screening plants, operated simultaneously in the quarry, were lined up on the quarry floor so that shovels could load directly from the quarry face to the primary crusher. Numbered lines 1, 2, and 3, these set-ups consisted of a primary crusher, a Cedarapids 40 hammermill and screening unit, a 4×14-foot double-deck screening plant, and surge bins and loading conveyors. Material flowed in a straight line from one unit to the next, and finished products were taken from the last unit by trucks, Euclids, or Koehring Dump-tors.

Lines 1 and 2, almost identical, produced the basic material used to make the concrete aggregate. Two of the 22-B or Paymaster shovels fed rock directly to the apron feeder of a 22×36 jaw crusher powered by a Caterpillar D8800 engine. From this unit, the rock was conveyed to the 40 unit, where a 40-inch hammermill and a 4×14-foot double-deck screen were arranged in closed circuit to keep the material circulating through the hammermills until it had all been reduced to a size of minus 1½-inch. The hammermills were powered by twin GM 6-71 engines, while the screen and conveyor of the unit were powered by a Caterpillar D318 engine.

Crushed material went from the second stage unit to a 4×14-foot double-deck screening unit, where the minus ¾-inch material was separated, conveyed to a 5-yard surge hopper, loaded by conveyor into Koehring 6-yard Dump-tors, and hauled to a storage area in the excavated portion of the quarry. This was waste material, as far as this project was concerned. Usable rock was loaded from a similar surge bin and conveyor-loader into International R-190 tandem-axle trucks or 10-ton Euclid end-dumps. These hauled down the steep hill to the washing plant.

### One line produces base

Line 3, set up to produce base material, had, instead of the primary jaw crusher, a Cedarapids 36×45-inch impact breaker powered by a GM 110-Series engine. The secondary

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crushing plant and the screening unit were similar to those in lines 1 and 2, but the final screen removed only the minus 1/8-inch material as waste. Rock produced by this line was hauled to a stockpile at the bottom of the hill, where it was blended with sand to produce the gradation required by the specifications.

Comparing the impact breaker with the primary jaw crushers, Anderson noted that the former handled at least 250 tons per hour while the jaw crushers had a maximum capacity of about 150 tons in this material. Since the impact breaker reduced most of the material to less than 3 1/2-inch size, the load on the hammermills in line 3 was much less than the loads in lines 1 and 2, which had jaw crushers passing 8 or 9 inch rock. One disadvantage of the impact breaker was that it exceeded the legal weight limits for highways and had to be partly dismantled for a move.

All the equipment was completely mobile in the quarry. Excluding the shovels, each unit was mounted on rubber tires so that each complete line was able to move ahead as the shovels used up the materials within their reach. It was never necessary to haul rock from the shovels to the crushers. Two shovels were assigned to each line, and when they came across chunks of rock too large to be handled, one was usually able to find time to break up the rock with a breaker ball while the second shovel continued feeding the crusher.

### Blend sand and rock for base

Sand was stockpiled adjacent to the pile of base rock, and the two materials were blended to produce the specified gradation. A Caterpillar D7 dozed the rock to a trap feeding a Barber-Greene 75-foot conveyor, and another D7 dozed sand to a Barber-Greene 50-foot conveyor set up at a right angle to the first.

Sand was carried to a 3x7-foot Kolman vibrating screen, mounted directly over the rock conveyor, which removed lumps and other undesirable material as the sand fell through to the rock conveyor. The two materials were carried to a 20-cubic-yard surge bin, where trucks were loaded by gravity.

Production of the coarse aggregate for concrete required an elaborate washing and screening operation. A Caterpillar D7 dozed the rock to the trap and a 50-foot conveyor carried it to a 4x14-foot three-deck Cedarapids vibrating screen. The 1 1/2 to 3/4-inch fraction was taken from the screen to an Eagle 36-inch log washer; the 3/4 to 3/8-inch fraction went to an Eagle single-screw washer.

These two fractions were combined again on a 4x12-foot double-deck screen. Undersize was removed and wasted, and finished material conveyed to a 15-ton surge bin that loaded trucks hauling to the concrete batching plant on the turnpike.

The minus 3/8-inch from the first screen was run through an Eagle double-screw unit that removed the water from the material before it was conveyed to a waste pile.

(Concluded on next page)



Cat D8's with dozers work the crushed-rock stockpile, left, and the sand stockpile, right, at the blending plant. Sand passes through a Kolman screen to fall to the Barber-Greene 75-foot conveyor. Blended material goes to the 20-yard surge bin where a Chevrolet truck is loading.

C&E Staff Photos



An International truck loads finished concrete aggregates from the 20-yard surge bin of Anderson's washing plant. Conveyors in the plant are equipped with 15-hp motorized head pulleys that eliminate the need for chains and belts and require only a nominal amount of maintenance.



In the quarry operated by B. L. Anderson, Inc., Cedar Rapids, Iowa, stripping operations are carried on by shovels like this Bucyrus-Erie 22-B. The 8 to 10 feet of shale and poor rock it strips are being loaded to Euclids hauling to waste areas. The area was stripped to reach a 19-foot ledge of usable rock.



After the Anderson quarry has been stripped, and before the Bucyrus-Erie 22-T drills begin putting down blast holes, the area is cleaned up by a Michigan Model 175A loader. Anderson's quarry produced concrete aggregates for Tecon Paving Co., Dallas, Texas.

(Continued from preceding page)

Five Cedarapids 50-foot conveyors in this washing and screening plant were equipped with 15-hp motorized head pulleys. Operating without chains and belts, the plant required less than the usual amount of maintenance and lubrication.

#### Turbine pumps supply water

The large volume of water required by this washing plant was supplied by two Deming 8-inch vertical turbine pumps powered by 50-hp electric motors. These pumps were installed at 10-inch wells drilled about 90 feet into water-bearing strata on the plant site. One pump produced 1,200 gpm, while the other produced 850 gpm.

Rainmaster aluminum pipe brought the water to the plant site and the various plant elements; similar pipe conducted dirty water to settling ponds where material was allowed to settle before the water was returned to a natural watercourse.

Power for the washing and screening plant, base blending plant, pumps, and other uses, was generated on the site by two 187-kva generators powered by General Motors Series 110 diesel engines.

This setup turned out blended base material at a rate of up to 350 tons per hour, while concrete aggregate production from the washer averaged between 150 and 160 tons per hour. A total quarry output of 400 to 500 tons per hour was required to supply both plants.

Practically every unit in Anderson's washing plant was also mounted on rubber tires, and though portability may have been of questionable value on a job of this size, the spread is well adapted to scattered work frequently done by state highway departments.

#### Personnel

General superintendent for B. L. Anderson on this project was L. V. "Bill" Porter. Foremen of the day and night crushing crews were Harold Hite, Cliff Trinder, Francis Hoffman, and Arnold Mowbry. The washing and blending plants were usually run only one shift per day under the supervision of David Lyons.

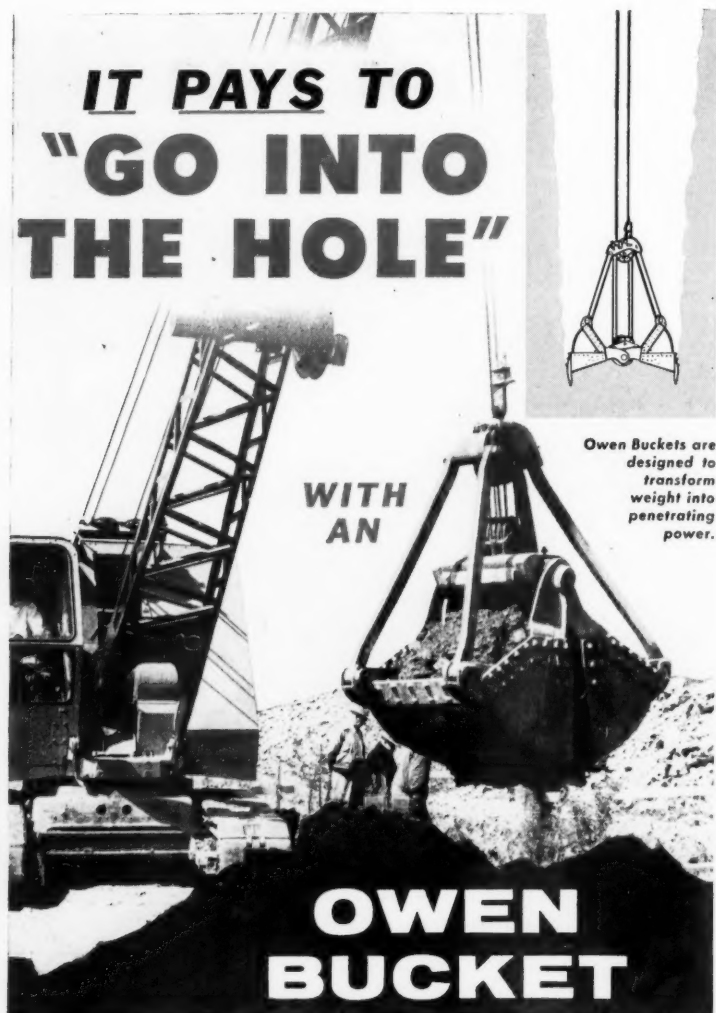
The rock production operation of Concrete Materials & Construction

Co. was under superintendent Donald "Red" Evans. Shift superintendents were John Waalk, Melvin Bledsoe, and Floyd Wheeler. Marvin Nelson, vice president and general production manager for the firm, is assisted by Dean Curphy.

THE END

#### Russell, Burdsall & Ward makes two appointments

Two new appointments have been made within the sales organization of Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y. James M. Dill, Jr., has been named assistant to the vice president in charge of sales, and Ward K. Jones will assume the post of assistant office sales manager. Both have been associated with the firm since 1946.



**IT PAYS TO  
"GO INTO  
THE HOLE"**

**WITH AN  
OWEN  
BUCKET**

Owen Buckets are designed to transform weight into penetrating power.

Photo courtesy of  
Boy City Shovels, Inc.

*and Come Up With*

**"A Mouthful At Every Bite"**

Here's an everyday "Going in the Hole" Operation where money is **MADE** not **LOST**.

Experienced excavating contractors and crane operators alike know that "Going in the Hole" with an **OWEN BUCKET** is profitable.

For better bucket maneuverability, maximum penetration, quick, full loading and rapid, complete discharge — you can't beat an **OWEN BUCKET**.

Special teeth simplify trenching operations and greatly shorten excavation time on every job.

*Write for the Catalog...*



**THE OWEN BUCKET CO.**

6030 BREAKWATER AVENUE • CLEVELAND, OHIO  
Branches: New York, Philadelphia, Chicago, Berkeley, Calif., Fort Lauderdale, Fla.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 220

## MIL-CARB<sup>\*</sup> carburized WASHERS

<sup>\*</sup>Trade-Mark

**are on this Job,  
too...**

Wherever there's a high-strength bolted construction project going on today, the chances are better than even that you will find MIL-CARB Carburized Washers on the job, such as the one shown here, for which bolts, nuts and washers were supplied by Russell, Burdsall & Ward Bolt and Nut Co., Port Chester, N. Y.

To quote Mr. John S. Davey, Vice President: "Bolting this year will account for 15% to 20% of all construction, whereas two years ago it was a very modest percentage of the total. The economies to builders and contractors have already been demonstrated; the advantages to the public in avoiding the din normally associated with new construction is evident from scientifically conducted and tabulated noise tests, indicating that bolting decibel ratings are less than half those of riveting."

And because no bolt assembly is any better than its washers, high strength bolting should include the use of MIL-CARB Carburized Washers to prevent "galling" or grinding of the washer... essential to permanent, uniformly strong, tight joints.

MIL-CARB Washers are fabricated from Prime Carburizing Quality Special Soundness Steel to insure uniform quality control, always equal to or exceeding the rigid specifications for high strength bolted steel construction.

For uniformly sound construction, specify  
"MIL-CARB" Washers and accept no substitutes.

Since 1887



Distributed by

**Leading Bolt Manufacturers and  
U.S. STEEL SUPPLY DIVISION**  
UNITED STATES STEEL CORPORATION  
208 South La Salle Street • Chicago 4, Illinois

**WROUGHT WASHER  
MANUFACTURING CO.**  
The World's Largest Producer of Washers  
2118 S. BAY ST., MILWAUKEE 7, WIS.



For more facts, use Reader-Reply Card opposite page 18 and circle No. 221

CONTRACTORS AND ENGINEERS

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SEPTEMBER



A Caterpillar final-drive hub rebuilt by Butler Machinery Co.

### Firm completely rebuilds Cat final-drive hubs

■ Rebuilding of Caterpillar final-drive hubs is a service offered by the Butler Machinery Co., Fargo, N. Dak. The firm also rebuilds worn flanges and bolt holes.

After the worn hubs are received, they are cleaned, recentered if necessary, welded up to original size, machined, thoroughly inspected, painted, and treated with a rust preventive. These, the company points out, are only a few of the steps taken in carefully checking and rebuilding worn hubs.

The company pays rail or truck transportation charges both ways, and claims that with its rebuilding service up to 50 per cent can be saved as compared to the cost of a new hub.

For further information write to Butler Machinery Co., 610 13th St. N., Fargo, N. Dak., or use the Request Card at page 18. Circle No. 128.

### Pipeline ditchers

■ The Gar Wood-Buckeye ditchers, Models 305, 307, and 308, are described in a catalog from Gar Wood Industries. Outstanding features of the ditchers are hydraulic conveyor drive, simplified group controls, and hydraulic digging wheel hoist. Design and construction of each ditcher is pointed out in separate spreads of the models. Separate and common standard and optional equipment for the ditchers is listed in a chart. Complete specifications are given.

To obtain Form F-209 write to Gar Wood Industries, Inc., Wayne, Mich., or use the Request Card at page 18. Circle No. 38.

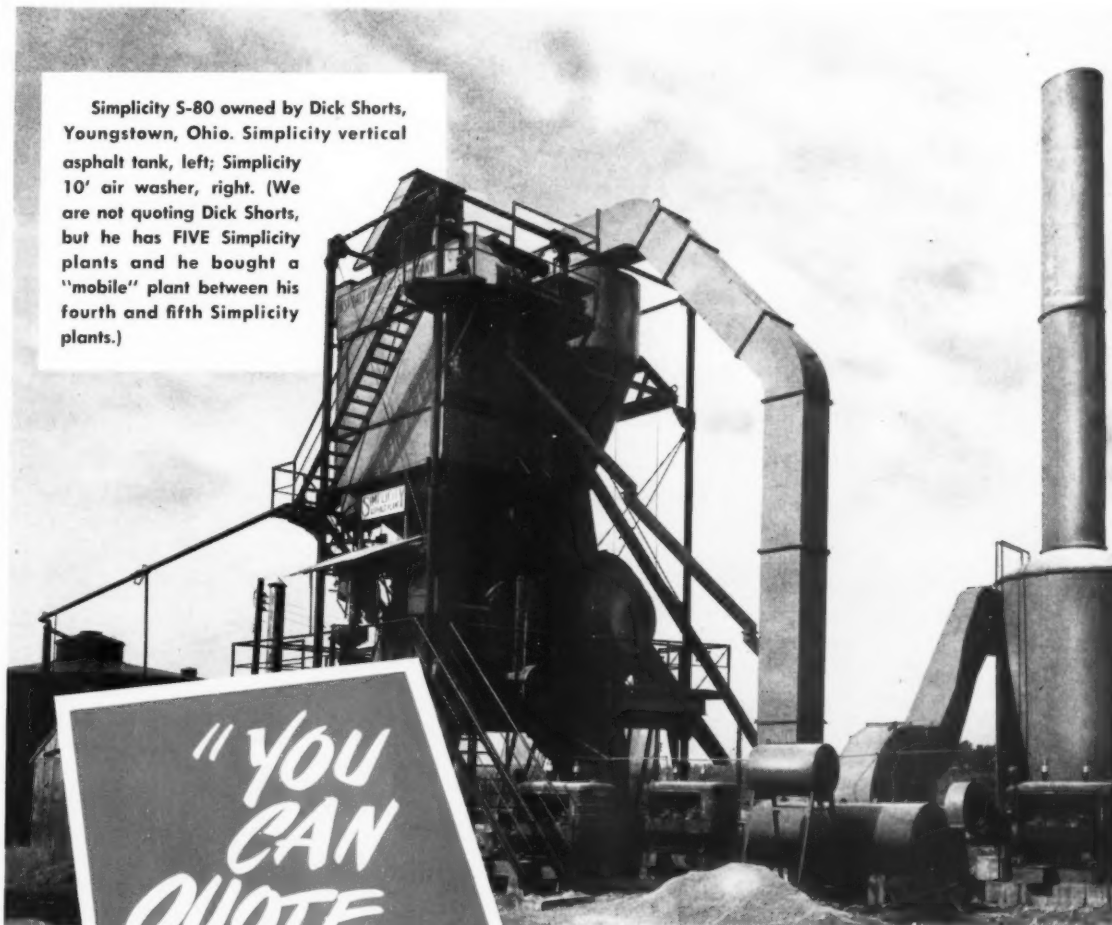
### Electric power hammer

■ Ingersoll-Rand's electric power hammer, said to deliver 2,300 blows per minute, is detailed in a catalog. Job photos show the one-man-operated hammer used for drilling, riveting, calking, chipping, and breaking. A cross-section view of the unit points out the design and construction features. The complete line of accessories is pictured and described.

To obtain Form 5199 write to Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y., or use the Request Card at page 18. Circle No. 44.



Simplicity S-80 owned by Dick Shorts, Youngstown, Ohio. Simplicity vertical asphalt tank, left; Simplicity 10' air washer, right. (We are not quoting Dick Shorts, but he has FIVE Simplicity plants and he bought a "mobile" plant between his fourth and fifth Simplicity plants.)



"YOU CAN QUOTE ME..."

our Simplicity Model S-80 asphalt plant is not only more dependable and economical in operation but also MORE PORTABLE than our (---) plant on wheels with diesel-generator set."

If you want more details, we'll put you in touch with the man who authorized this quotation.

**THE SIMPLICITY SYSTEM**  
FROM BUILDER TO BUYER  
BETWEEN MEN WHO KNOW

**THERE'S A SIMPLICITY PLANT NEAR YOU**

On request, we'll be glad to send you the name and location of a nearby installation.

**DEPENDABLE**  
**THE SIMPLICITY SYSTEM COMPANY**  
RIVERSIDE DRIVE      PHONE 2-2144      CHATTANOOGA 6, TENNESSEE

For more facts, use Reader-Reply Card opposite page 18 and circle No. 222



Three John Deere Model 50 wheel tractors, each pulling a John Deere fertilizer spreader and a Brillion Sure Stand seeder, cover every square foot of level areas and gentle slopes with commercial fertilizer and grass seed mixture.

C&E Staff Photo

## Changes in mulching procedure triple speed of roadside crews

# 195hp

## for BIG Performance

### HUBER-WARCO 5D-190 GRADER



The Huber-Warco 5D-190, with torque converter and full power-shift transmission, will handle the toughest grading jobs smoothly and quickly. A perfect balance of weight and power gives highest working efficiency. Hydraulically cab-controlled blade movement (90° either side with no manual adjustments) and power-sliding moldboard are added performance features.

For a demonstration—See your nearest Huber-Warco Distributor



**HUBER-WARCO COMPANY**  
MARION, OHIO, U. S. A.

Road Machinery

CABLE ADDRESS: HUBARCO

ROAD ROLLERS • MOTOR GRADERS • MAINTAINERS • GRINDERS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 223

A thirty-man seeding and mulching crew will still be working the length of the 236-mile Kansas Turnpike after the road opens next month, but a changeover in methods will enable the crew to finish its job earlier than expected.

Originally, the crew applied a mixture of straw and asphalt to the roadside from the blower of a Finn mulch spreader, the asphalt, carried in barrels, being mixed with the straw as it left the blower. With this method, each of the four machines handled 250 to 400 bales of straw per day. With the new method, asphalt binder is applied to the mulch with a special spraybar on a conventional asphalt distributor, while the mulcher is used only to blow the straw. This switch in the operation, eliminating time lost in changing the cumbersome barrels of asphalt, enabled a single mulcher to go from a maximum production of 400 bales per day to 1,400 bales.

#### Seeding follows grading

The Turnpike authority, to minimize erosion and eliminate confusion among the several contractors working on each section, is doing its own landscaping with John Webb, Jr., a former U. S. and Kansas soil conservationist, as supervisor. After selecting his equipment and organizing his crew, Webb had the team working under field foreman Otto Meinhardt as soon as grading was completed on sections of the pike. Seeding operations continued on shoulders, back-slopes, and other parts of the right-of-way while contractors were placing base and paving. Work on the median had to wait until paving and shouldering operations are completed, so this phase of the job will continue even after the road is in use.

The seeding of level areas or gentle slopes is being done with three John Deere Model 50 wheel tractors, each of which pulls a John Deere fertilizer spreader and a Brillion Sure Stand seeder. These rigs apply a commercial fertilizer and a specially selected and blended grass seed.

On the steeper slopes, seeders and fertilizer spreaders are pulled by three John Deere Model 40 crawler tractors. These crawlers operate safely and efficiently on slopes as steep as 2 to 1, and their small size and low profile make them well suited for work under bridges, where the slopes are steep and headroom is limited.

The Brillion seeders are particularly well adapted to seeding sloping areas. Two sets of toothed rollers de-



**Special distributors with long spraybars anchor straw on slopes; method replaces blowing of mixed mulch and asphalt on seeded areas**



The special 11-nozzle spraybar, fed at one end and at the middle, juts out from a Standard asphalt distributor to apply a light coat of cutback asphalt to the mulch to hold it in place until seed germinates. The spraybar can be lowered or raised when it is being used over cut or fill areas. *Official Kansas Turnpike Photograph*

**Distributors speed work**

posit the seed at a uniform depth of about a half inch, then pack the earth back over the seed to aid germination and prevent wind and rain from carrying off the lighter seed.

On all except the flatter slopes, the seeded area is covered with a straw mulch held in place with asphalt. Only bright small grain is used. Before the 1956 harvest season, good straw had become scarce and had to be purchased from farmers within a reasonable hauling distance of the turnpike, then delivered to the right-of-way ahead of the mulching operation.

When the mulching operation could be done from the roadway grade, one of the four Finn mulchers was pulled behind one of the Ford F-600 trucks carrying the bales of straw. With favorable winds, the mulchers covered most slopes in a single pass. Straw was normally applied at a rate of about 100 bales per acre and, under favorable conditions, a five-man crew covered 14 acres per day.

As soon as possible after the straw had been spread, the coating of asphalt was applied at a rate of about three gallons per bale of straw. Cut-back asphalt MC-2 or MC-3 was delivered in 4,000 to 6,000-gallon truck transports from Kansas refineries at Kansas City, El Dorado, Wichita, or Arkansas City. Hot asphalt, rather than emulsified asphalt, was used so that operations could continue during cold months.

Two standard asphalt distributors, each with a 1,080-gallon capacity, applied the asphalt through special spraybars. This technique, tripling the speed of the operation, was an idea Webb came up with while working with the engineers of Standard Steel Works, Inc., North Kansas City, Mo.

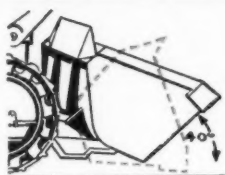
The distributors are of conventional design, except for the long, non-circulating spraybars that are attached at the right rear of the machine and project as much as 21 feet. The bars are attached to the distributors with swivel joints so they can be tilted above or below the horizontal position. A light cable running over a mast or A-frame at the rear of the distributor supports the spraybar and enables the operator to raise or lower it.

When the distributor is operating from the roadway on a fill section, the bar can be lowered to an angle below the horizontal; when working from

(Concluded on next page)

**SO FAST...YOU'D THINK IT WAS ON WHEELS...**

# the all new Rear-engine 13¼ yd. International® Payloader®



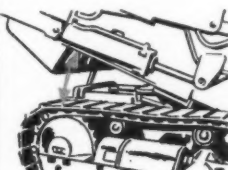
**NEW PRY-OUT FORCE**  
International-built 77 net hp diesel engine, short-coupled power train, positive hydraulic action and 40° tip-back bucket on ground break-out pads combine to give tremendous pry-out force.

	1st	2nd	3rd
Forward	0-1.6	0-4.5	0-10.1
Reverse	0-2.1	0-5.7	0-13.1

**NEW HIGH SPEEDS**  
The Payloader's top speed of 10 mph forward is nearly three times faster than most other competitive units. Top reverse speed of 13 mph is four times faster.



**NEW VISIBILITY**  
Operator is always "on top of his work" because of rear-engine design. He works faster with less effort. To shift or steer, he pulls a hydraulic lever. There is no master clutch or steering pedals.



**NEW SERVICIBILITY**  
Only tractor-shovel with tilting body, the Payloader permits mechanic to get at all four sides of engine easily and quickly. Tilting body for servicing takes only a few minutes.

Here's the new tractor-shovel that surpasses all competitive models for speed...gives you fastest loading cycles...yet offers you crawler traction and stability for greater production and more profitable work in any terrain...in any weather. It's the all new, rear-engine, 13¼-yard International Model 12 Payloader...with new, high speeds, unmatched in crawler history...with new pry-out force necessary in rock and other tough materials...with new visibility, a result of rear-engine design...and new serviceability obtained by tilting the body to reveal engine and other components. See all these and many other International Payloader features at your International Construction Equipment Distributor, soon. Then try it! It's so fast...you'll think it's on wheels.

**INTERNATIONAL® CONSTRUCTION EQUIPMENT**

International Harvester Company  
180 North Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Boom Tractors... Self-Propelled Scrapers and Bottom-Dumps... Crawler and Rubber-Tired Loaders... Off-Highway Trucks... Diesel and Carbureted Engines... Motor Trucks.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 224



Spreaders and fertilizers are pulled safely on steep slopes, and even under bridges where headroom is limited, by John Deere crawler tractors. Seeders deposit grass seed at a uniform depth of 1/2 inch even on these slopes, then repack the soil.

(Continued from preceding page)

below a seeded area, the bar can be raised above the horizontal. On wide slopes, 40 or more feet in width, distributors are sometimes operated together, one at the bottom and the other at the top.

The spraybar of one of the machines is fitted with 9 nozzles, while the other has 11. Independent valves on the nozzles make it possible for the width of spray to be adjusted. To help maintain the flow and uniform pressure, the spraybars are fed at the middle, as well as at the end attached to the distributors. A flexible hose carries the asphalt from the pump to the middle of the bar.

Effectively protecting the grass seed from heat, cold, and erosion, the black

surface of the asphalt-covered mulch is already fast giving way to the bright green of new grass along the entire turnpike, even though the job of the seeding and mulching crew is still to be finished. **THE END**

### New impact tool features automatic torque control

■ An electric impact wrench that utilizes the torsion bar principal for automatic torque control has been announced by Ingersoll-Rand. The 5UT Impactool will run down fastenings quickly to a present torque and then automatically shut off. With standard accessories it can be used to drill



metal, masonry, or wood; ream; tap; drive screws; or do wire brush or hole-saw work within its rated capacity up to 3/4-inch bolt diameter.

Setting the tool to the desired torque is accomplished by holding the torsion bar in a vise and using a wrench to turn the bar to the desired reading on a calibrated sleeve. The setting may be made for either left or right-thread torque. Two bars are available to cover a torque range of from 20 to 90-foot pounds. The torque setting is extremely accurate and remains constant for any nut-running operation until the adjustment is changed.

The 5UT Impactool has a 1/2-inch square drive. It weighs 6 1/2 pounds and has an over-all length of 10 1/4 inches less torsion bar. Its approximately free speed (forward or reverse) is 1,900 rpm and it delivers 1,900 impacts per minute.

For further information write to the Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y., or use the Request Card at page 18. Circle No. 111.

### Testing screen

■ A mechanical testing screen for concrete aggregates is featured in a catalog from the Gilson Screen Co. The installation, operation, and maintenance of the screen is fully detailed. The main-drive housing, corner spring, and clamp-rod assemblies and their parts are pictured. Additional and replacement parts are listed.

To obtain Form No. 150 write to the Gilson Screen Co., 110 Center St., Malinta, Ohio, or use the Request Card at page 18. Circle No. 40.

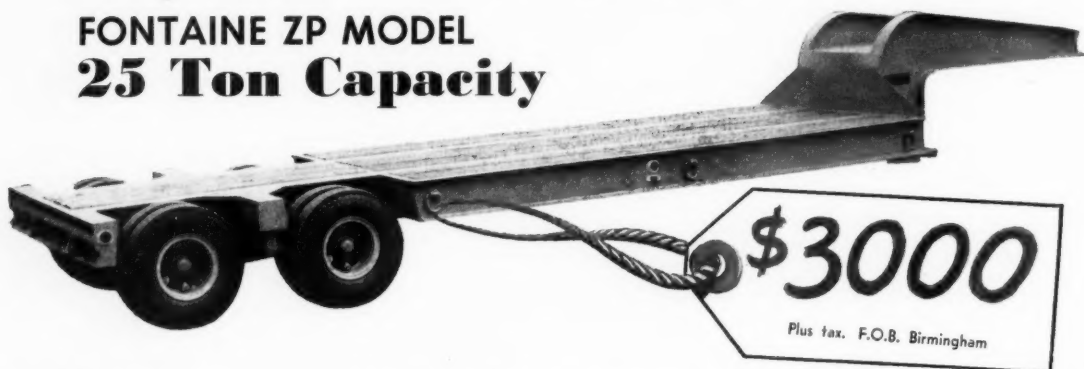
### Alcoa names L. B. Foster aluminum railing jobber

Aluminum Co. of America, Pittsburgh, Pa., has appointed The L. B. Foster Co., Pittsburgh, Pa., a national selected highway railing erector-jobber for aluminum railings.

CONTRACTORS AND ENGINEERS

## Buy Direct and Save!!

### FONTAINE ZP MODEL 25 Ton Capacity



Eight 8.25x15 12-ply tires  
Heavy Duty Axles  
Air Brakes  
I.C.C. Lights

Main Frame, 16-in. Wide Flange Beams  
Outside Frame, 12-in. Channels  
Positive Alignment Walking Beams  
Lashing Rings and Loading Ledge at Rear

Platform Length, 16 feet  
Platform Width, 8 feet  
1 3/4-inch Oak Flooring  
Quality Workmanship

Other Models and Capacities up to 200 Tons

## Fontaine Truck Equipment Co., Inc.

Manufacturer of Quality Heavy Duty  
Machinery Trailers for 16 Years

Box 1591-C, Birmingham 1, Ala.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 225

## GAR-BRO

## Selection Chart

### POWER-CARTS



### CONCRETE-CARTS



### WHEELBARROWS



Equipment	Load Capacity	Maximum Travel Distance	Speed	Capacity* Per Hour
POWER-CARTS	9 to 12 cu. ft.	1000 ft.	15 mpr.	15 to 20 cu. yds.
CONCRETE-CARTS	6 to 8 cu. ft.	200 ft.	walking	3 to 5 cu. yds.
WHEELBARROWS	3 to 5 cu. ft.	200 ft.	walking	1 to 1 1/2 cu. yds.

\*according to hauling distance

### "Designed with Concrete in Mind"

SELECTION OF EQUIPMENT is most important in planning any concrete job—it can make the difference between profit and loss. That's why Gar-Bro offers check lists to guide you in considering all job factors. Remember, Gar-Bro builds the only complete line of concrete handling equipment. And only Gar-Bro dealers can give you unbiased advice in the selection of the best equipment. Write for catalog!

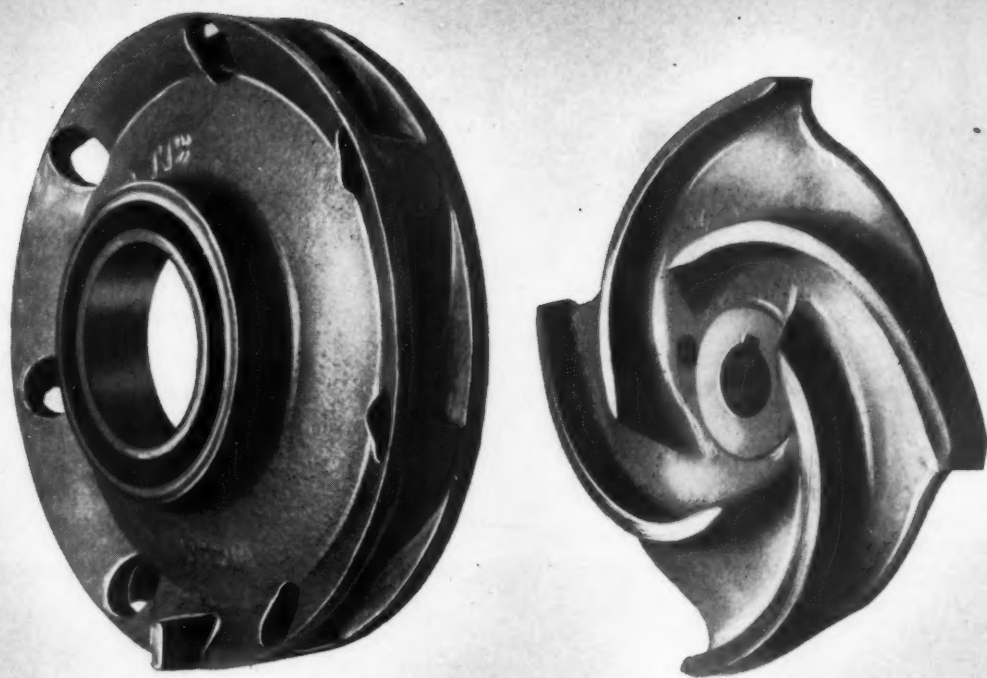
Ask your dealer  
for a Gar-Bro Concrete Handling Manual

GAR-BRO MANUFACTURING CO. • Los Angeles, California • Peoria, Illinois  
General Offices: 2415 East Washington Blvd., Los Angeles 21, California

The world's most complete line of  
**Concrete Handling Equipment**

## GAR-BRO

For more facts, use Reader-Reply Card opposite page 18 and circle No. 226



A pump diffuser and a pump impeller. These two parts mean fast, dependable priming and economical rebuilding after long, hard service.

## Replacing Two Simple Parts Restores Pump's Full Efficiency

### Modern "Diffuser" Pumps Rebuilt Easily, Rapidly, Inexpensively

Metal parts in any pump will wear after hard service, particularly when handling suspended sand or abrasive solids. Therefore, economical rebuilding is essential. In diffuser-primed pumps, rebuilding is accomplished by replacing two simple parts — the diffuser and the

impeller. It is not necessary to replace the expensive pump casing. Full factory efficiency is restored with the replacement of these parts. Replacement of the diffuser and impeller is easy and the parts are inexpensive and readily available.

Diffuser-primed pumps are fast priming, resistant to clogging and economical to rebuild . . . and only a Marlow pump is diffuser primed. Ask your dealer to show you Marlow's Contractor's Pumps and the two inexpensive replacement parts. They mean better pumping and greater economy to you.



This is "diffuser priming." Note the 360° cleaning action and the "multiple point priming."

Diffuser-primed pumps are the only contractor's pumps which offer this cost-saving advantage and also provide the other two essential requirements of self-priming pumps: quick priming action and clog resistance.

Quick priming is obtained in Marlow Contractor's Pumps because the diffuser provides a multiplicity of priming points. Each vane in the diffuser performs this function. With at least six vanes in the Marlow pump, it tends to separate air faster, thus priming more rapidly.

When a Marlow is primed, water is discharged through all diffuser ports around a full circle. Dirt and debris cannot accumulate because its 360° cleaning action clears clogging accumulations at the base of the pump casing. There are no dead segments to hold muck and silt which reduce pumping efficiency.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 227



6-130A

## MARLOW PUMPS

Division of Bell & Gossett Company  
MIDLAND PARK, NEW JERSEY

Morton Grove, Illinois

Longview, Texas



Mounted on a Ford tractor and powered by the tractor engine, a Danuser post driver puts down treated wood posts on which right-of-way fencing will be installed. Gerlach Builders Supply, Inc., Topeka, Kans., held the fencing contract in this rural area.

C&E Staff Photo

## Turnpike fencing moves fast as machines drive wood posts

**Two-man crew drives up to 30 posts per hour along right-of-way; both treated wood and steel posts used in 525 miles of fencing**

More than a half-mile of finished fencing per day was the record set by gangs working on the 525 miles of woven and barbed-wire fencing required to enclose the Kansas Turnpike right-of-way from Kansas City to the Oklahoma state line.

Much of the speed of this operation is attributed to the use of post drivers for installing the pressure treated wood posts on which about three-quarters of the fencing was installed. These posts, set at 14 foot centers, had a minimum diameter of 3 inches, and virtually all of them were machine driven, after they had been sharpened at the plant before being treated. In a few places, the wood posts were set in bored holes.

The remainder of the right-of-way fencing was done with steel posts, driven at 12-foot centers. These had a minimum weight of 1.33 pounds per linear foot and were protected by a coating of two pounds of zinc per square foot.

Though both types of posts were permitted on the pike, the firms fencing the pike under 43 separate contracts could use only one type of post on a stretch covered by a contract. The specifications insured that the finished appearance of the fence would be uniform for long stretches.

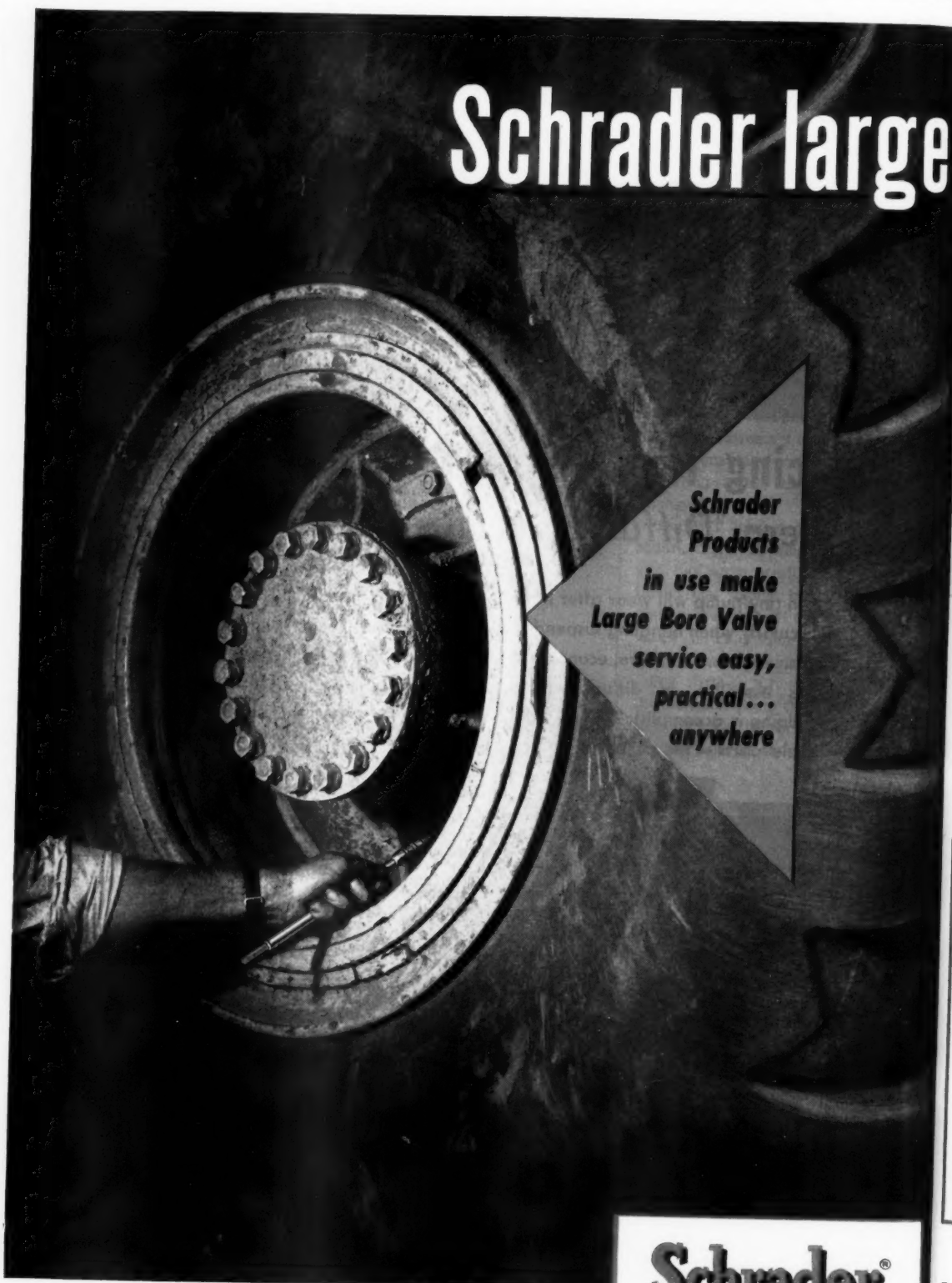
### Driving attachments

The fencing work, authorized early so that the right-of-way could be enclosed and expedite roadway construction, was started as soon as men stretched a bottom strand of barbed wire between the right-of-way points set up by the project engineers.

Twenty-two post drivers were used on the pike during the fence construction. All of them were built as rear attachments to farm tractors by the Danuser Machine Co., Fulton, Mo. Resembling miniature pile drivers in operation, they made it possible for a crew of two men to drive as many as 30 line posts per hour. This included the time needed to move the machine up to a post and place the driver in position. During driving, the wood posts were hit directly by the 200-pound hammer; a driving cap was used with steel posts.

Whenever rock was encountered, it had to be broken up by men working with air hammers. Frequently, 3-inch-diameter holes were drilled in the

## Schrader large bore



**Schrader  
Products  
in use make  
Large Bore Valve  
service easy,  
practical...  
anywhere**

**Schrader®**  
ESTABLISHED IN 1844

CONTRACTORS AND ENGINEERS

rock to proper depth, and the posts driven into the finished holes.

Like the line posts, the corner, brace, and pull posts were also machine driven. These posts were pointed and driven to a greater depth, however, the corner posts going as much as 3½ feet deep.

#### Treated posts

Nearly all the wood posts used on the Kansas turnpike job came from the Arkansas tree farms of Dierks Forests, Inc., Kansas City, Mo., and were treated at this firm's De Queen, Ark., plant. Here, the southern yellow pine posts were pressure treated with either creosote or a 5 per cent solution of pentachlorophenol in fuel oil to a final retention of 6 pounds per cubic foot of wood, in accordance with the

standards of the American Wood-Preservers' Association.

The treated posts will be practically safe from grass fires, since the protection given them will not permit decay to gain a foothold. They will be immune to any annual burning-off or fence-row fire, receiving at most a char only 1/16 to 1/8-inch deep. The 3-inch diameter line posts used on the turnpike are capable of withstanding a steady pressure up to 430 pounds, and a breaking force of 1,785 to 2,000 pounds is required for the 5-inch-diameter corner, anchor, gate, and end posts. With an annual cost of 3 to 4 cents as compared to 13 cents or more for untreated wood, the posts are generally expected to serve on the turnpike for the first 30 years or more of its operation. THE END



"Next time, Frank, just let the men climb out over the sides."

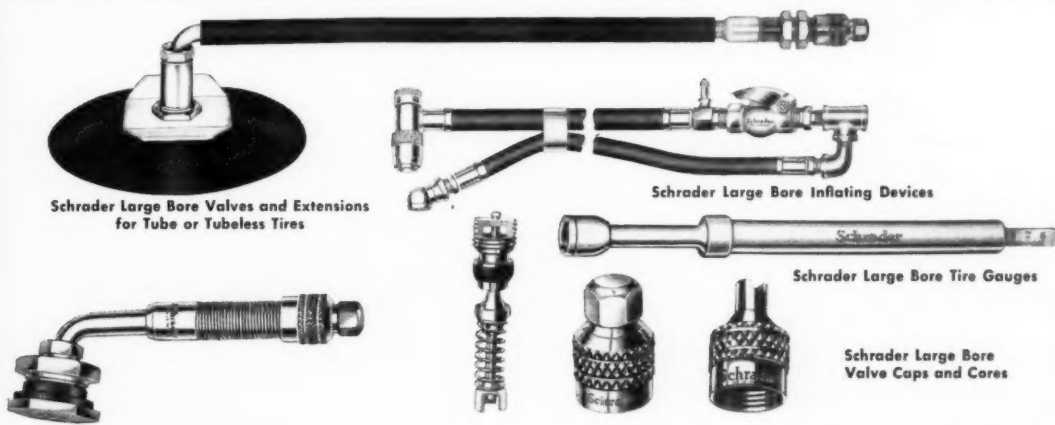
# Large bore tire valves for best performance off-the-road

Schrader has all the answers to your questions about large bore tire valve service. Up-to-the-minute information on tube or tubeless. Information that is reliable, and easy to get, because your questions are our business and we have the answers ready.

Wherever vehicles move heavy loads over rough terrain, Schrader Large Bore tire valves, gauges and service equipment are available for the large size tires.

Retaining the fundamental design of the famous Schrader long-core principle, the larger bore permits faster inflation and deflation and is constructed especially to withstand rugged service conditions.

Today, Schrader also provides new Tubeless large bore valves. Schrader has long meant top quality, top service for all tire gauges, valves and tools. Make Schrader your headquarters for service and information wherever you use air.



A. SCHRADER'S SON, Division of Scovill Manufacturing Company, Incorporated, 470 Vanderbilt Avenue, Brooklyn 38, N. Y.

FIRST NAME IN TIRE VALVES

FOR ORIGINAL EQUIPMENT AND REPLACEMENT

For more facts, use Reader-Reply Card opposite page 18 and circle No. 228

SEPTEMBER, 1956

## ARBA releases directory of highway officials

The 1956 edition of the directory "Highway Officials and Engineers" has been released by the American Road Builders' Association. Containing more than 1,500 names, titles, and addresses of administrative engineers and officials, the booklet covers the 48 states and the District of Columbia.

A state-by-state tabulation showing highway funds expended during 1955 as well as an estimate of expenditures for highway construction and maintenance during 1956 is featured. The handbook also contains a list of administrative personnel of the Bureau of Public Roads, including the heads of divisions, and a list of the engineers and administrative personnel of toll-road authorities.

In addition to a directory of executives of the ARBA, its divisions, and its headquarters staff, the objectives and policies of the ARBA are also given.

Priced at \$1, the booklet is available from the American Road Builders' Association, 600 World Center Bldg., Washington 6, D. C.

## Sound, color film covers pole-type construction

Pole-type construction, used for warehouses, garages, stores, and offices, is shown in a 16-minute 16-mm sound and color film, "Put It on Poles," which has been produced by the Dow Chemical Co., Midland, Mich. Pole buildings in many stages of construction are shown in the film, which is available to building contractors, building-supply houses, and industrial firms.

Prints of the film may be borrowed, without charge, from Modern Talking Picture Service, 45 Rockefeller Plaza, New York 20, N. Y.

## Adm. Moreell wins award

The John Fritz Medal, awarded annually for achievement by four engineering societies, will be given next month to Adm. Ben Moreell. A civil engineer, Adm. Moreell was cited for his work in naval construction when announcement of the award was made by the groups, which include ASCE.

## First aid catalog

■ A first-aid catalog available from E. D. Bullard Co. contains a complete listing of first-aid kits manufactured by Bullard. Kits pictured and described include a unit pack and cylindrical, roll-up, and pocket packs. The contents of each kit are listed.

To obtain the catalog write to the E. D. Bullard Co., 275 Eighth St., San Francisco 3, Calif., or use the Request Card at page 18. Circle No. 31.

## Diesel, gas power units

■ Two gasoline and two diesel-power units are featured in separate bulletins from Hercules Motors Corp. The gasoline units, one a 4-cylinder and the other a 6-cylinder model, have

4 × 4½-inch overhead valves, according to the bulletins. The 4 and 6-cylinder diesel engines have 4 × 4½-inch direct-injection units. Complete specifications are given.

To obtain Bulletins P. U. 501, 502, 503, and 504 write to Hercules Motors Corp., Market and E. 11th Sts., Canton, Ohio, or use the Request Card at page 18. Circle No. 134.

## C. M. Greiner dies

Charles Michael Greiner, chairman of the board of directors of the Buffalo-Springfield Roller Co., Springfield, Ohio, and former president of the firm, died July 12 in Washington, D. C. He headed the company from 1916, when it was formed, to 1946.



Connected to the mixer engine of a transit mixer the DuMont EnginScope quickly diagnosed improperly set points and a cam wobble.

## Portable tester locates ignition system troubles

■ A portable testing machine that will detect a variety of engine troubles is available from Allen B. DuMont Laboratories, Inc. The DuMont EnginScope has a miniature TV-like screen on which ignition troubles show up in the form of patterns of light.

By observing the light patterns, a mechanic can quickly ascertain the nature and location of many engine faults, including fouled, misfiring, open, or shorted spark plugs; defective coils, condensers, wiring, and switches; worn distributor cam and

shaft bearings.

In operation, the EnginScope is connected to the ignition system by a pair of signal clips. Throughout the testing operation, the leads are never removed from their original connecting points. The tester may be operated from an automobile battery by means of a power pack, or from a 117-volt ac outlet.

For further information write to Allen B. DuMont Laboratories, Inc., 750 Bloomfield Ave., Clifton, N. J., or use the Request Card at page 18. Circle No. 161.

## New Euclid representative in West and Southwest

Blane Currence has been appointed district sales representative for the Euclid Division of General Motors Corp., Cleveland, Ohio. From head-

quarters in Denver, Colo., he will cover a territory including the states of Arizona, New Mexico, Texas, Colorado, Wyoming, and Nebraska.



Whether you're leaving a burning building—or buying a forward mounted telescopic hoist—investigate before you act!

With a Galion Duo-scope hoist, you'll get up to 1,500 lbs. of added payload capacity and the assurance of dependable performance with long, trouble-free service life.

Don't settle for less than the best—a hoist with Galion Allsteel quality construction plus Duo-scope hoist cylinders . . . the finest that craftsmen can build!

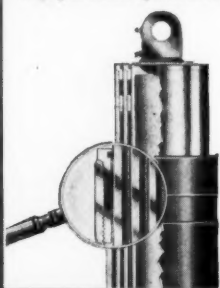
AA-1131

Ask your Galion distributor about Duo-scope hoists today.

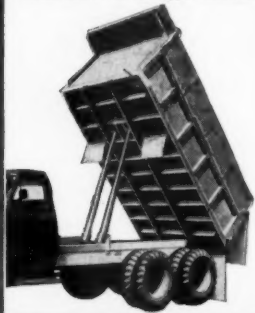


For more facts, use Reader-Reply Card opposite page 18 and circle No. 229

Duo-scope fully-telescoping hoist cylinder features precision ground sleeves and self-adjusting chevron-type seals. Synthetic rubber wiper rings guard seals against dirt damage.

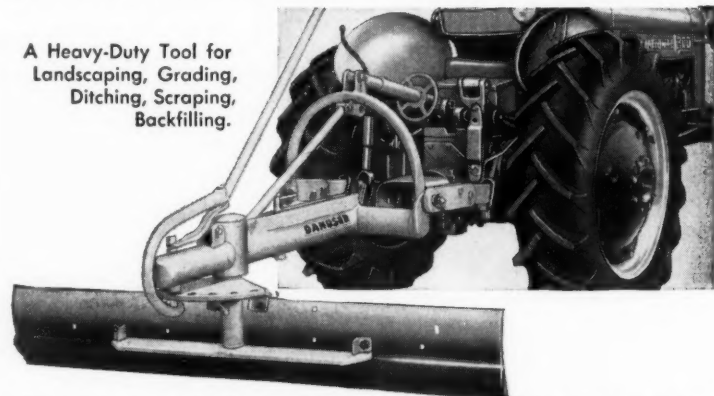


Model 66381 forward mounted Duo-scope hoist, capacity 22 tons. Optional center or outrigger mounting.



## Low-Cost Blade Makes Your Light Tractor an Efficient Earth Mover!

A Heavy-Duty Tool for Landscaping, Grading, Ditching, Scraping, Backfilling.



One man can operate the DANUSER BLADE by himself and make adjustments without leaving the tractor seat. Blade uses the tractor three-point suspension principle, with adapter kits available for older models. It is raised and lowered by the tractor's hydraulic system, and turns all the way around so you can push with it.

Rugged construction throughout. Built of reinforced welded structural steel and heavy tubular members. Abrasion-resistant moldboard

with replaceable, standard grader cutting edge. Moldboard mounting is supported on two oversize tapered bearings to maintain stability. It shifts 8 inches right or left of center for cutting beyond tractor wheel line.

Danuser built the original rear-mounted blade, and is still producing the finest tool of its kind on the market. Thousands are in daily use throughout the world. Tested and approved by tractor manufacturers.

"Quality Since 1910"

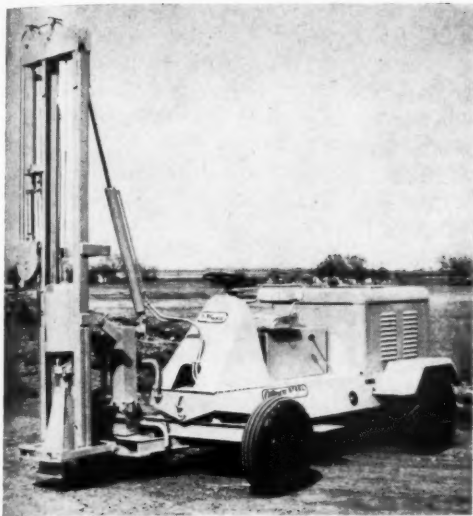
**DANUSER MACHINE CO.**

535-44 East 3rd Street • Fulton, Missouri

If you will give us the model of your tractor, we will be glad to furnish complete descriptive material.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 230

CONTRACTORS AND ENGINEERS



The '57 model Ottawa Hydra-Hammer has many new features as standard equipment.

### Versatile tamping unit in new, improved model

Hydraulically controlled tower tilt and lay-down, an improved engine cover which can be locked against theft, adjustable seat and brake pedal, hydraulic transmission and shock accumulator, rear fenders, and a streamlined appearance are among the features of the new Ottawa Hydra-Hammer.

This one-man-operated multipurpose machine is used to cut asphalt and break concrete pavement for trenching or demolition work, to tamp backfill in trenches, to tamp rock or heavy aggregate in stabilizing subgrade, to compact blacktop patches, and to drive highway guard-rail posts or short piling.

The tower traverse arrangement on the Hydra-Hammer enables fast, smooth horizontal left or right movement of the tower, while still maintaining a vertical position. A 4-foot path can be broken or compacted to original density in 4 to 6-foot lifts with direct blows, according to the manufacturer. A trouble-free creep speed is accurately controlled by the brake pedal.

For further information write to the Ottawa Steel Division, L. A. Young Spring & Wire Corp., 5th and Main, Ottawa 60, Kans., or use the Request Card at page 18. Circle No. 125.

### Field mechanics course added by operators school

A course of field mechanics, added to those offered by the National School of Heavy Equipment Operation, Inc., Charlotte, N. C., is designed to give men a knowledge of the general maintenance and overhaul of the diesel engines that power earthmoving equipment. The next course starts October 29. Welding, engine disassembly, and work on the cooling, air intake, lubrication, hydraulic, and suspension systems are among the subjects covered. Tuition for the 8-week course is \$400.

The school, started in March of 1955, also offers courses in the operation and maintenance of the crawler tractor and scraper, motor grader and self-propelled scraper, and hoe and dragline. Information on classes, schedules, and tuition may be had by writing Box 8243, Charlotte, N. C.

### Material-handling cart

Job photos in a folder offered by the company show the many uses of the Prime-Mover material-handling cart. A description of the cart claims that it can handle loads up to 1,500 pounds indoors or outdoors. The specifications table states that the Wisconsin 5-hp 4-cycle air-cooled engine has a fuel capacity of 4 gallons.

To obtain the folder write to the Prime-Mover Co., Sampson St., Muscatine, Iowa, or use the Request Card at page 18. Circle No. 58.

### Equipment catalog

A revised 1956 manual of the complete line of Syntron equipment is now available. Pictured and briefly

described are such items as vibrators, feeders and screens, diesel pile hammers, power tools, gasoline hammer drills, and portable electric saws. Specifications are tabulated on each unit. Information is given on all models of Syntron equipment.

To obtain Catalog No. 564 write to the Syntron Co., 227 Lexington Ave., Homer City, Pa., or use the Request Card at page 18. Circle No. 65.

### Set second radar island

A second radar island in the chain that will stretch along the Atlantic seaboard was set in place 27 miles southeast of Nantucket Island last month. The first of these towers has been operating for a year 110 miles east of Cape Cod.

## Here's why



## ROCK RIPPERS

### lick jobs others can't touch!

#### TOUGHEST, BEST-DESIGNED SHANKS!

Contoured for extra strength at strain points; made of manganese-moly steel, heat treated four times.

#### DRAWBAR MOUNTING SAVES YOUR TRACTOR!

Rugged ATECO drawbar takes the pull, protects you against costly transmission case damage.

#### HEAVIEST-DUTY CONSTRUCTION ON THE MARKET!

Tool beam, for example, is box-girder welded of 1 1/2" steel plate with sides in compression. Solid steel—not the weld—takes the strain.



#### OUTPERFORMS 'EM ALL!

Replaceable rock points have splitting wedges; underground "quiver" of curved shanks works like a jackhammer to shatter rock and shale fast, with less power. Rock is rolled up and out in the clear, back of tool beam.

Make your "cat" a 3-way profit maker with an ATECO ripper plus your dozer—ready to rip, bulldoze or push-load instantly without tool changing! No other ripper on the market matches ATECO's reliability and performance—why settle for less? Promptly available for Caterpillar D9, D8, D7 and D6 tractors—see your Caterpillar dealer or write today for literature.

American



TRACTOR EQUIPMENT

Corporation

Designers and Manufacturers Since 1920

9131 SAN LEANDRO BOULEVARD • OAKLAND 3, CALIFORNIA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 231



The Michigan T-24 excavator-crane now boasts a 25-ton capacity.

### New excavator-crane has 25-ton capacity

■ An increased rating to 25 tons and a new chassis incorporating the Clark power train are features of the Michigan T-24 excavator-crane introduced by the Construction Machinery Division of Clark Equipment Co.

The rig has a gvwt of 51,000 pounds equipped as a crane, and this can be reduced to 41,500 pounds for highway travel by removing the rear outriggers, crane boom, and counterweights. For steel erection, the T-24's maximum boom length has been increased from 80 to 100 feet, with job booms 15 to 30 feet in length available.

The power train consists of a five-speed transmission, a two-speed transfer case, and planetary wheel driving axles—all Clark-designed and built. With a 130-hp gasoline chassis engine, ease of safety of operation at maximum travel speed of 39 mph is provided by a hydraulic steering booster and all-wheel air brakes.

All-wheel 6x6 drive is standard equipment, and riding qualities have been improved through redesigned front-axle overload springs. The new truck chassis is of all-welded construction with 18-inch, 58-pound steel channel-frame rails.

The crane's upper mechanism, increased from 94 to 104 horsepower, has air-controlled shaft and drum clutches, with power up and down on the load line as standard equipment. The counterweight slabs are power-operated for ease in stripping the machine for highway travel.

For further information write to Clark Equipment Co., Construction Machinery Division, P. O. Box 599, Benton Harbor, Mich., or use the Request Card that is bound in at page 18. Circle No. 82.

### Booklet on girder bridges

Bulletin No. 124 from the Highway Research Board, "Vibration and Stresses in Girder Bridges," contains six papers that had been presented at the board's 34th annual meeting in 1955.

Dynamic deflections, the dynamic effects of live loads on highway bridges, and the applications of new electronic strain-recording equipment and the results obtained in two tests are discussed. Reports are also given in two types of vibration studies and on the highway bridge impact problem.

Priced at \$2.55, the bulletin may be obtained by writing to the Highway Research Board which is located at 2101 Constitution Ave., Washington 25, D. C.

### Lightweight utility pump boasts high capacity

■ A self-powered, portable utility pump that weighs 55 pounds and will operate at rates of 500 gpm or more is announced by the Thompson Equipment Machine Co. The Tempco Turbo consists of a small gasoline engine, an electric-welded tube, a drive shaft, and a rotor.

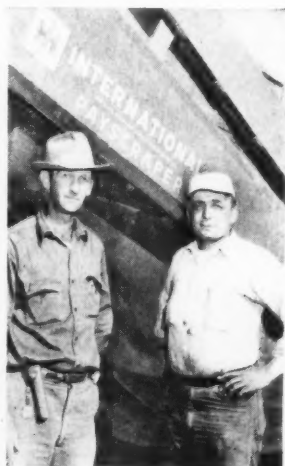
The new pump is recommended for use in the construction field as a sump pump for emptying drainage ditches and flooded excavations. It is powered by a 2½-hp, 4-cycle, air-cooled gaso-



The Tempco Turbo pumps 500 gpm through a 5-foot lift at 3,600 rpm.



## "Years of lowest downtime" back preference for schedule-beating International Equipment



Foreman Milton D. Peterson and Supt. H. L. Radandt beside one of Radandt's new Payscrapers.

It's a \$394,000 relocation and regrading job of Wisconsin 27, between Ojibwa and Ladysmith—involving clearing, grading, culverts, and sand gravel fill up to base course. Approximately ½ million cu. yds. of excavation and borrow to do.

Cuts as deep as 21 feet are required—and one 32-foot fill is necessary, because of a 22-foot deep marsh excavation, to base new road on firm footing.

A 12-unit International prime mover fleet—pushers, dozers, rubber-tired Payscrapers®, and crawler-scraper team—is what Contractor H. F. Radandt, Inc., banks on to "wind 'er up," ahead of the Wisconsin winter, with a profit!

"Have been using International crawlers since 1946," states Supt. H. L. Radandt, for the contracting firm. "Presently we have nine International crawl-

ers and three Payscrapers in the fleet. Years of actual operation have proven International equipment had given us good service with lowest downtime. We do all our own repair work, and International design is simple to work on."

**Prove how** exclusive Planet Power steering with full-time live power on both tracks, plus finger-tip operating ease, give the International TD-24 exclusive production-boosting advantages! Compare capacity of new bonus-powered International equipment to anything else on tracks or wheels. Find out what International unit assembly construction means for overhaul speed and simplicity—for reduced downtime—for new upkeep economy. See your nearby International Construction Equipment Distributor for a demonstration!

line engine and has a turbine rotor and foot that is designed to cut any debris which may enter it. A built-in baffle at the discharge end deflects water from the pump housing.

The turbine impeller is corrosion-resistant, as are all submerged parts. The outboard bearings are made of nylon and require no lubrication. The capacity is in excess of 500 gpm with a 5-foot lift at 3,600 rpm. The fuel tank holds 1 1/8 quarts.

For further information write to the Thompson Equipment Co., 844 E. South St., York, Pa., or use the Request Card at page 18. Circle No. 153.

## Slopes shaped, cleaned with grader attachment

■ A sloper blade attachment for motor graders permits the simultaneous grading of adjacent level and sloping areas. Manufactured by Briscoe Manufacturers of California, the sloper-grader is recommended for highways, shoulders, ditches, canals.

The sloper blade can be operated independently of the grader's main blade or in combination with it. It slopes down as low as 6 feet and its depth is controlled by the operator through the grader's hydraulic sys-

The sloper blade can be used simultaneously with the grader's main blade.



tem. A chain coupling between the far edge of the sloper blade and the grader chassis regulates the reach of the sloper blade.

The sloper blade can be used with the grader operating in second or third gear. If the blade is retracted, the grader may be used normally without the sloper causing any interference. Besides grading, the sloper blade may be utilized for weeding and for cleaning operations.

For further information write to Briscoe Manufacturers of California, 4129 Del Norte Ave., Kerman 2, Calif., or use the Request Card at page 18. Circle No. 151.

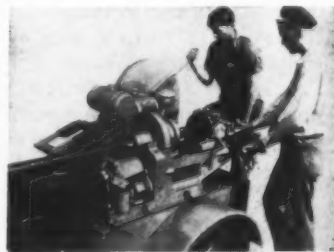
## Portable pipe shop combines two machines

■ The Beaver Pipe Shop on Wheels now being marketed by Beaver Pipe Tools, Inc., combines the No. 20 Beaver Speed-Cut abrasive cutting machine and the newly remodeled Model-A pipe and bolt machine on a pneumatic-tire trailer. The unit can be hauled by car, truck or jeep right to the work site.

The No. 20 abrasive cutting head is powered with a Wisconsin 8.3-hp gas engine or with a 5, 7 1/2, or 10-hp 220/440 volt, 60-cycle, 3-phase motor. The Model-A pipe and bolt machine is powered with a Universal 110 or 220-volt single-phase 25 to 60-cycle motor; a 220/440-volt, 3-phase, 60-cycle motor; or a 2,500-watt dc generator with extra outlets for small electric tools.

The abrasive cutting machine has a cutting capacity up to 6-inch pipe, or shapes, and to 2 1/2-inch solid stock. The pipe and bolt machine handles 1/8 to 2-inch pipe and 1/4 to 2-inch bolts. Specifications for the entire unit include: floor to top of body—28 inches; end to end, over-all—92 inches; body width—47 inches; body length—50 inches; floor to top of feed handle—66 inches.

For further information write to Beaver Pipe Tools, Inc., Warren, Ohio, or use the Request Card at page 18. Circle No. 99.



The Beaver Pipe Shop on Wheels combines an abrasive cutting machine and a pipe and bolt machine.

For more facts, circle No. 232



Dumping of the new 75 Payscraper takes only 10 seconds. Higher apron lift, and bigger apron opening assure new dumping speed and positive clean-out ability. The new Payscraper's high horsepower - to - capacity ratio permits rapid acceleration to 24 mph top speed - a big yardage-booster!

The three Payscrapers in the Radandt fleet average 2200 cu. yds. per 10 hours—on a 6300 lineal-foot round trip. "The new '75' has matched engine power to deliver the payload fast, and flotation to take roughest pit or haul-road conditions," adds Mr. Radandt.



This torque-converter TD-24 is one of three International crawlers towing scrapers on the job—hauling up to 1000 lineal feet one way. With 200 net engine hp and full-time traction power on both tracks with Planet Power steering, this outfit hauls fill dirt into one of the 22-ft. deep cuts.



Another TD-24—a veteran in the Radandt fleet—spreads and compacts fill dirt on one of the marsh-excavated spots. TD-24 Planet Power steering is particularly productive on all blade work. Full-time live power on both tracks results in faster cycles, bigger loads.



"The new design 75 Payscraper bowl loads and unloads, fast and easy," declares Supt. Radandt. "Estimated average load: 18 pay yards!" Here, loading time with TD-24 as pusher, the 75 heap-loads in 45-60 seconds, in silt-sand-gravel mixture!

by H. F. Radandt, Inc.,

Eau Claire, Wisconsin

See you at  
the ROAD SHOW—CHICAGO  
Jan. 27 to Feb. 4, 1957



# INTERNATIONAL® Construction Equipment

International Harvester Company, 180 N. Michigan Avenue, Chicago 1, Illinois

COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Beam Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Trucks . . . Diesel and Carbureted Engines . . . Motor Trucks



A floating concrete plant is ready to turn out deck concrete for the high-level section of the Gandy River Bridge. Paralleling the existing Tampa Bay crossing from Tampa to St. Petersburg, it will relieve the older structure of all westbound traffic.

## High-production precastinuts



## KANSAS TURNPIKE: MARVEL OF FAST ROAD BUILDING

236 miles of super highway put through in 2 construction seasons—that's the engineering-construction marvel of the \$140 million Kansas Turnpike which is slated for an early October opening.

Super compaction equipment played a big part in this record building, too; the Freeto Construction Co., Pittsburg, Kans., and the T. L. James Co., Ruston, La., were but two of the turnpike contractors who relied on BROS 50-ton Roll-O-Pactors to obtain 100% AASHO densities on the top 18" of subgrade and 95% on the lower 18". Compaction was handled in 6" lifts.

Specifications called for three passes with the 50-ton rollers after specified densities had been reached. Because of soil variations, the CBR (California Bearing Ratio) varied between 50-75% on the subgrade.

### FOR WIDE VARIETY OF ROCK, SOIL AND MOISTURE CONDITIONS

Roll-O-Pactor compaction results fulfill the strict design criteria written for the whole range of acceptable turnpike subgrade materials. Why? Because BROS compaction engineers grew up with heavy earthwork consolidation... developed and pioneered the vital 19° wheel oscillation and pitch control features of heavy rubber tire rollers... cooperated with federal and state engineers in proving the unmatched value of this equipment for consolidation and densification of subgrade materials.

Write for complete Roll-O-Pactor information or see your nearest BROS Distributor.

**WM. BROS BOILER & MFG. COMPANY**  
Road Machinery Division

1057 Tenth Ave. S. E. • Minneapolis 14, Minnesota

For more facts, use Reader-Reply Card opposite page 18 and circle No. 233



Top Photo: Freeto Construction Company's BROS Model 450 roller compacting subgrade on the Turnpike. Center: T. L. James Co. Model 450 compacting subgrade on Section 11 of the Turnpike. Bottom photo: Compaction on the same section with the BROSSP-54 Self-Propelled rubber tire roller.

Mass production of 1,644 precast and prestressed girders, 1,500 composite concrete piles, and hundreds of concrete diaphragms by Hardaway Contracting Co., Port Tampa, Fla., and Columbus, Ga., enabled this contractor to complete the \$2,600,000 Gandy Bridge across Tampa Bay, Fla., so that the new span could open seven months ahead of schedule. Using only one concrete plant, Hardaway was able to pour three caps and three deck spans every 9-hour day.

Paralleling the existing two-lane structure that carries U. S. 92 across the bay, the new bridge provides an additional 26-foot wide roadway stretching 2½ miles between St. Petersburg and Tampa. Prestressed girders are used in 252 spans that are 48 feet long and in 20 spans that are 72 feet long. Three main spans—the 86½-foot channel span and the two 74-foot spans flanking it—consist of all-welded continuous steel girders. On each side of the steel girder spans are 10 of the 72-foot spans, which are made up of reinforced-concrete column bents. These raise the roadway elevation near the main channel so that a drawbridge is not needed. The existing low-level structure parallel to the new bridge, completely supported on pile bents, has a drawbridge in line with the 86½-foot channel span of new bridge.

#### Yard operations

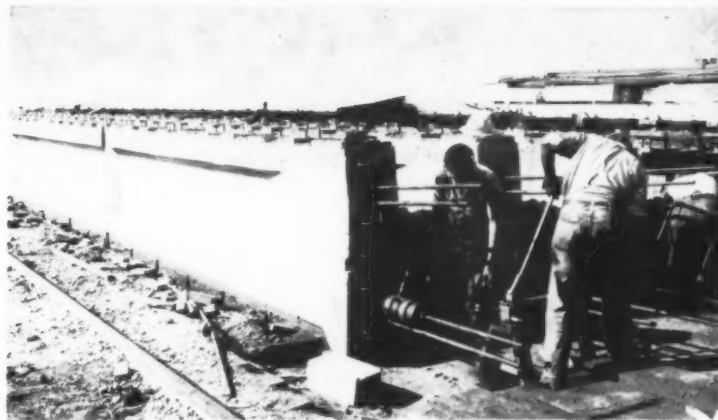
The contractor began his multi-phase operations by setting up a pre-casting and prestressing yard in Port Tampa, 2½ miles over water from the bridge site. Here, 132 of the 72-foot girders and 1,512 of the 48-foot girders were cast and stressed. Here too, more than 1,500 composite concrete piles, 22 to 85 feet long and 20 inches square, were precast. Hundreds of concrete diaphragms with post-tensioning holes were also manufactured in the yard.

The batch plant at the yard consisted of a Johnson 2-compartment aggregate bin, a Heltzel 250-barrel cement silo, and a 125-barrel cement bin. Two stockpiles were maintained—one for sand and the other for ¾-inch-minus crushed limrock. A crane with 50-foot boom and an Owen 1-yard clamshell bucket charged the aggregate bin and maintained the stockpiles. Rock, sand, and cement, brought to the yard by bottom-dump rail cars, were delivered to a siding

CONTRACTORS AND ENGINEERS

# astinuts bridge ahead of schedule

by ANTHONY N. MAVROUDIS, field editor



A Simplex 90-ton jack applies a 50-ton stress to one of the 72-foot girders. Stressing of all six post-tensioning bars in a girder resulted in an average elongation of 2 inches and made the girder rise about 5/8-inch at the center. C&E Staff Photo

running between the aggregate bin and the cement silo.

Trucks with 2-batch capacity were first loaded with 1,032 pounds per batch of sand and 2,021 pounds per batch of stone, at the Johnson aggregate bin. Then driving to the cement bin, they picked up 564 pounds of cement per batch. Cement was weighed out by a Yale scale, and Aerolith and Darex air-entraining agents were added to each batch to keep the air content of the concrete at about 3 or 4 per cent.



Four feet of a 9-foot-long 10 WF 89 steel tip section protrudes from each of the piles cast in the yard. This allowed the 1,500 composite piles to go to a 4-foot penetration in limerock. C&E Staff Photo

Batches were delivered to the casting beds, where a Koehring 34-E paver and a Clyde gantry crane handled the pouring operations for girders, piles, and diaphragms. The paver, located outside the casting beds, was easily moved from one bed to another. Supplied with water from a hydrant, it mixed the concrete and discharged batches into a 2-yard concrete bucket handled by the gantry. The gantry, riding rails along the side of the beds, handled the pours, stockpiled the completed piles and girders, and loaded the barges that took the girders or piles out to the bridge site.

## Concrete girders

Precasting and prestressing operations for the 48-foot girders and the 72-foot girders were similar. Steel forms for the girders, furnished by Concrete Forms Corp., New York, N. Y., were originally used by Hardaway during work on the Sunshine Skyway connecting the mainland and the southern tip of St. Petersburg. After the forms had been set, but before concrete was placed, all the reinforcing bars and post-tensioning rods with their flexible metal liners, were positioned in the forms. The 1 1/8-

(Continued on next page)



## A NEW APPROACH IN EARTH BORING EQUIPMENT

### It's New! It's Revolutionary! It's Rugged!

The new crawler-turnstile mounted WILLIAMS MDHC Hole Digger is the answer to many problems of the foundation contractor.

Travel of the unit into digging position and all other operations are controlled by the digger operator. The turntable-slide mechanism permits rapid spotting of the auger and the drilling of holes anywhere within a 270-degree arc around the machine and extending or retracting of the drilling unit over a distance of two feet at any point within this swing. These features, plus the well known performance of the MDH Digger, all add up to a real money-maker.

**HUGH B. WILLIAMS MANUFACTURING CO.**  
8330 LOVETT AVE. • BOX 7815 • DALLAS, TEXAS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 234



A plant consisting of a Johnson 2-compartment aggregate bin and a Heltzel 250-barrel cement silo with 125-barrel hopper supplies batches for the precasting operations at the contractor's yard.

C&E Staff Photos

(Continued from preceding page)

inch-diameter rods and the liners were supplied by Stressteel Corp., Wilkes-Barre, Pa.

Six of the post-tensioning bars were used in the 72-foot girders, which are 4 feet deep and have an I-beam-type cross-section with top and bottom widths of 16 inches. Two bars, one above the other, are located at the top of the girder so that they form a parabolic curve as they slope downward from one end of the girder, then upward again at the opposite end. The remaining four bars are placed in two rows of two each along the bottom of the girder. These rows are far enough apart so that the upper two rods, curving downward, run between them. All the post-tensioning

bars were held in place by the temporary steel spacer bars.

Concrete test cylinders, taken during the girder pours, were tested after five days had elapsed. If, at that time, the concrete showed a strength of 3,600 psi or better, the rods were stressed. A maximum load of 50 tons, placed on each bar by a Simplex 90-ton hydraulic jack, resulted in an average elongation of 2 inches. The load was permanently transferred from the jack to the bar by an automatic lock nut that was positioned against steel bearing plates at either end of the girder. The stressing of all six bars made the midpoint of the girder rise approximately  $\frac{3}{8}$  inch.

After the stressing operation, the bar liner was pressure-grouted through  $\frac{1}{4}$ -inch nipples to tie the bar with the liner that had been embedded in the girder.

#### Precast piles

The concrete piles were precast in plywood forms with 5 feet of a 9-foot-long 10 WF 89 steel tip section embedded in the concrete. This left a 4-foot-long driving tip needed to obtain the required 4-foot penetration into the lime-rock stratum.

The 22 to 85-foot-long piles, barged to the site, were driven through about 10 feet of sand and shale to refusal by a Vulcan hammer handled by a floating Wiley Whirley crane.

The 252 approach spans consisted of 4-pile intermediate bents and 6-pile tower bents spaced on 48-foot centers. Pile caps for each bent were cast in place with concrete supplied from a floating mixing plant.

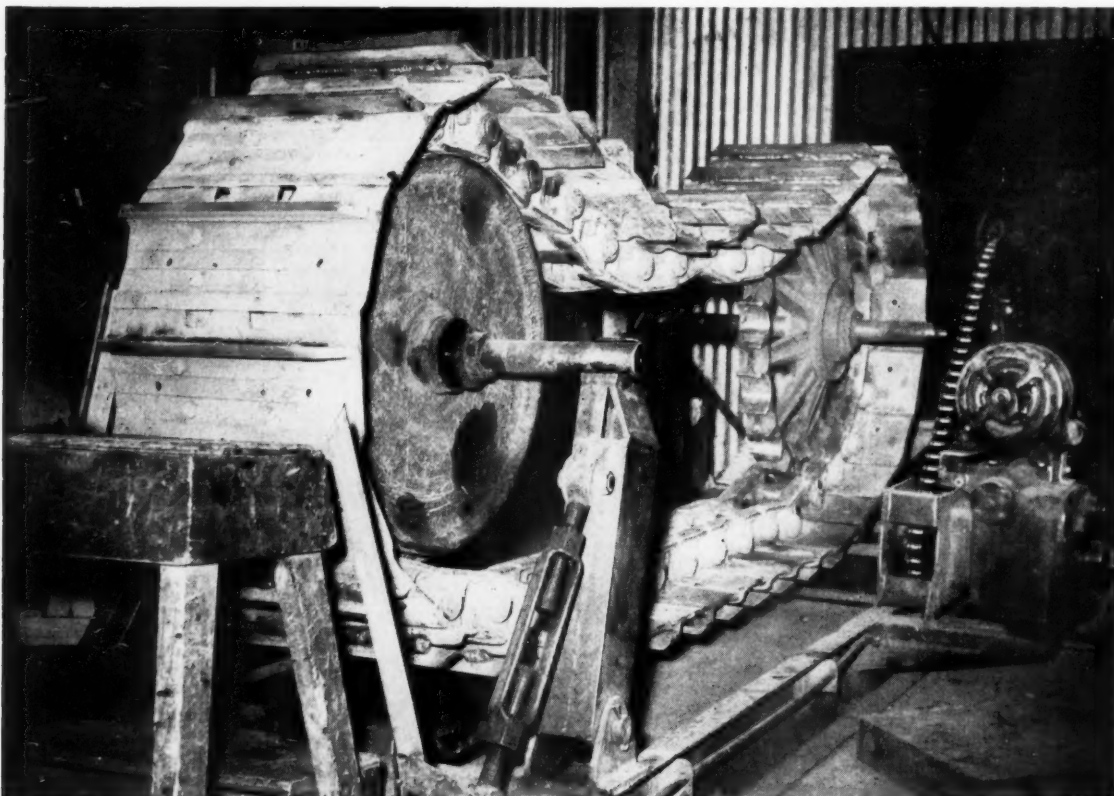
The twenty spans that are 72 feet long consist of reinforced-concrete column bents that were also cast in place with concrete supplied by the floating mixing plant. Each bent has two tapered columns supported on two concrete footings. These footings, 7 feet 6 inches and 9 x 4 feet thick, encase two 5-pile clusters. On top of, and connecting the two pile-cap footings, is a reinforced-concrete tie beam that also connects the base of the columns.

#### Channel span

Piers for the 86½-foot channel span were built in 12 x 35½-foot cofferdams made up of interlocking sheet piling. A McKiernan-Terry 9-B hammer mounted on the Wiley crane did this driving job. H-piles also had to be driven to provide a sufficient amount of bearing for the west pier, since there was a variation in the rock ledge on which these piers are founded.

As soon as sand and shale overburden had been removed from the cofferdams, a 10-foot-thick tremie seal was placed for the west pier. A 15-foot thick seal was poured directly on rock for the east pier. Concrete for these seals was supplied by the floating concrete plant.

As soon as the tremie seals had been placed, pumps were set to work to unwater the cofferdams. This done, a 4-foot 9-inch-high distribution block, measuring approximately 11 x 34 feet, was formed on top of the seal. To bring the piers above water



## Positioning Fixture for REBUILDING and HARD-FACING TRACTOR GROUSERS

With spreads operating throughout the Western States from New Mexico to Washington, the Isbell Construction Co. with its head office in Reno has complete facilities for maintenance of heavy earth working equipment at its home base. A fixture for positioning crawler track assemblies to speed the repair of grousers is so ingenious as to have attracted wide attention.

In order to keep their tractors moving, the shop has in stock spare tracks for replacement; when grousers are worn, the track is taken off the crawler and sent to the shops, the replacement assembly is supplied and the tractor goes back to work. The old track is mounted on

the fixture shown above and, as time permits, the shop weldors handle the rebuilding job. The fixture has a conventional idler and sprocket on which the track is mounted, the device being adjustable to handle a track assembly of varying length. The sprocket is power driven through a gear reducer.

The assembly is rotated so that a weldor can work on grousers at either end, welding in down hand position. The worn grouser is squared up by a cutting torch and steel bar stock,  $\frac{1}{2}$ " x  $1\frac{1}{4}$ ", is welded on with high tensile electrodes. After the bar is welded in position a single heavy stringer bead of Stoddy Self-Hardening is run across the top

to give it extra wear protection.

The company has found that this fixture cuts welding time in half, simplifies handling of the track assembly and the use of hard-facing alloys stretches out service life between track overhauls.

The Stoddy Guidebook—the "Bible" of heavy equipment maintenance—is yours for the asking. For your nearest Stoddy dealer check the "Yellow Pages" of your phone book or write direct.

#### STODDY COMPANY

11936 East Slauson Avenue  
Whittier, California

For more facts, use Reader-Reply Card opposite page 18 and circle No. 235

level, the contractor poured a 21-foot-high tie-bar on top of the distribution blocks in one lift.

The columns for these piers were built first, since they were the tallest in the bridge. Varying from 10 to 37 feet in height as they make the transition from the low-level pile-bent approach spans to the high-level channel span, the columns were all poured in one lift in steel-backed plywood forms. After two days, the forms were loosened and lifted off the columns as complete units by the Wiley floating crane. The concrete was sprayed with Hydrocide curing compound. As forms were removed, they were cut with a torch to make them shorter for successive pours. There were two complete sets of forms for this work, and each one was cut down eleven times as operations moved shoreward. Only once during the course of the project were the forms relined.

Four steel girders were erected to complete the 86½-foot channel span and the two 74-foot flanking spans. The channel span, located about a half-mile west of the Tampa shore so that it is in line with the existing drawbridge, provides a 65-foot-wide channel with a vertical clearance of 44 feet.

As the shorter columns on each side of the channel span were completed, a concrete cap was cast in place to connect them. This cap is 28 feet 6 inches long, 3 feet wide, and 5 feet 6 inches deep. Six prestressed girders were placed on top of the column and pile-bent caps by the Wiley crane for each 48 and 72-foot span. The concrete diaphragms were placed between the prestressed girders and prestressed to 50 tons to tie the girders together laterally.

#### Concrete deck

The 7-inch reinforced-concrete deck, providing a 26-foot-wide roadway between 9-inch curb barriers, was cast in place in forms fabricated on the job. As soon as the pour was completed, Hydrocide curing compound was sprayed over the concrete. The slab, which is structurally tied to the girders by means of shear blocks and pins formed during pre-casting, was stripped of forms in 8 days.

#### Floating concrete plant

All concrete, except that precast in the yard, was supplied to the bridge by a barge-mounted plant. On the barge were a Blaw-Knox aggregate bin and cement silo, a Koehring 34-E dual-drum paver that was used as a mixer, a batch truck that transferred materials from the bins to the mixer, a Lima crane that charged the aggregate bins, and a Link-Belt Speeder with a 1¼-yard bucket for handling the pours.

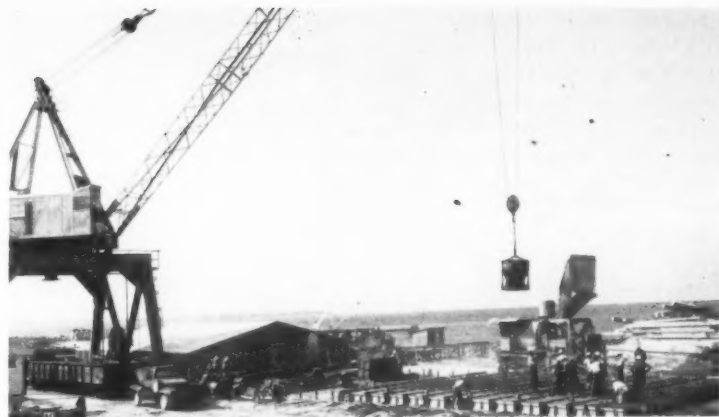
Aggregates, sand, and cement arrived at the plant via the contractor's yard in Port Tampa. Rail cars delivering aggregates and sand to the yard were diverted onto a trestle running out into the water. Barges waiting under the trestle were loaded by the bottom-dump rail cars. Cement was brought to the end of the rail

trestle to be loaded on cement barges. The rail cars bottom-dumped the cement into a screw conveyor, which transferred the material to the 1,200-barrel-capacity steel hoppers on the barge by means of an enclosed conveyor and chutes.

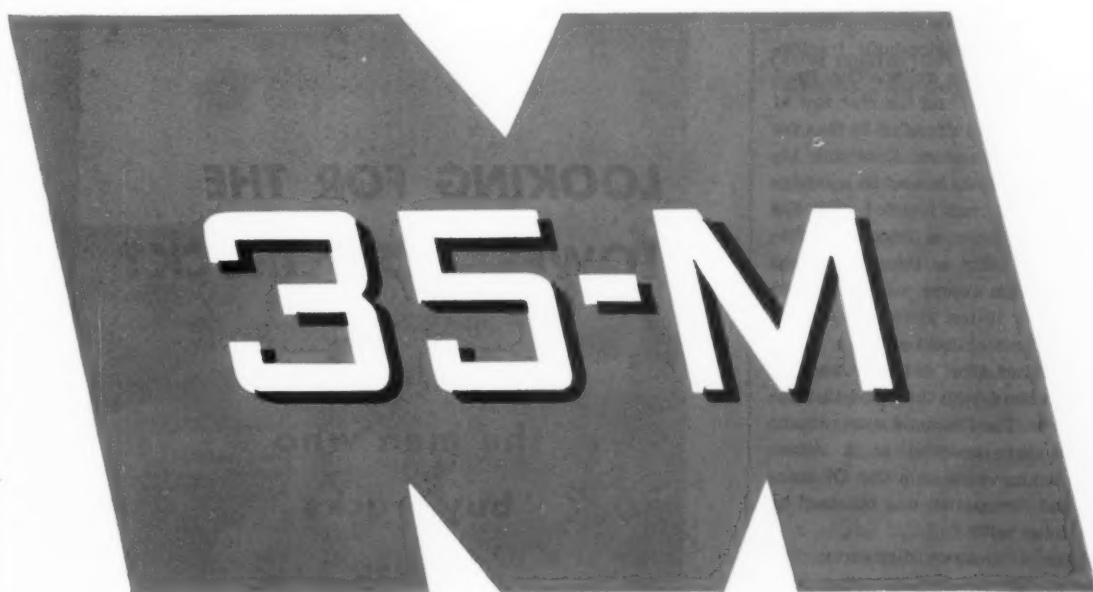
The cement was transferred from the barge to the silo of the floating plant by a screw conveyor. It was transferred from this silo to the enclosed compartment of the aggregate bin by an enclosed elevator.

Batches of aggregate, sand, and cement were weighed out and dumped into the batch truck, which merely had to back up a few feet to empty its contents into the skip of the Koehring paver. Mixing water was supplied to the paver from the barge compartment.

(Concluded on next page)



Concrete mixed in the Koehring 34-E paver is dumped to forms for composite piles by a Clyde gantry crane handling a 2-yard concrete bucket. The gantry also stockpiles girders and piles and loads them to barges for delivery to the job.



**NEW!**

from cats  
to boom sheaves

¾ Yard Shovel - 18 Ton Crane - Air Control

Easy to convert - Self-Cleaning Crawlers

Independent Boomhoist - Also available as

35-MR Truck Crane

Optional equipment: torque converter, independent travel



See your Marion Distributor for Details!

**POWER SHOVEL COMPANY**

Marion, Ohio

For more facts, use Reader-Reply Card opposite page 18 and circle No. 236

(Continued from preceding page)

ments, which were filled at Port Tampa. The material barges also had their compartments filled with an additional supply of water for the mixer.

#### Approach roads

The 24-foot-wide approach roads, linking U. S. 92 and the new bridge, consist of a mile-long stretch on the Tampa side and a 1.7 mile approach on the St. Petersburg side. The two approaches were built under a separate \$365,000 contract by Brinson Construction Co., Tampa.

A total of 128,000 cubic yards of hydraulic fill—most of it sand and shale—was pumped up on either shore by a 12-inch dredge to form the approaches. Caterpillar No. 10 bottom-dumps, loaded by a Koehring  $\frac{3}{4}$ -yard crane, built up the fills.

Compaction of the subgrade fill was done by a contractor-built tractor-drawn rubber-tire roller. The front row of four tires and the rear row of five tires carried a load of 12 tons for compaction purposes. Diamond 12-yard dump trucks hauled in a sandy-clay fill that was blended with the hydraulic fill by a Seaman Pulvi-Mixer to obtain a 1-foot stabilized subbase. This course was compacted by a Huber 10-ton three-wheel roller.

Over the stabilized subbase, an 8-inch crushed lime-rock base was put down in two 4-inch thick and 12-foot-wide lifts. The Diamond dump trucks hauled this material to a Jersey spreader mounted on a Cat D7 tractor, and compaction was obtained by the Huber roller.

After a pressure distributor had primed this 8-inch base course with 0.11-gallon of RC-1 per square yard, a 2½-inch asphaltic-concrete binder course was put down in two 12-foot widths by a Barber-Greene finisher. The Barber-Greene finished the job with a 1-inch asphaltic-concrete wearing surface.

#### Personnel

Dwight Plyler was the general superintendent and J. E. Gibson, the superintendent, for Hardaway Contracting Co., of which John Money is president. W. T. Skipper was the superintendent for Brinson Construction Co., and Joseph Maseda is the resident engineer for the Florida State Road Department. THE END

#### Seaway consultant wins service award

A. Frederick Griffin, special engineering consultant to the North Central Division of the U. S. Army Corps of Engineers, has been awarded the Sustained Superior Service Award granted by the Department of the Army.

Griffin has been responsible for the over-all planning and coordination of designs, plans, and specifications for the St. Lawrence Seaway project. He also holds the Award for Exceptional Civilian Service, which he earned while serving with the Corps of Engineers in St. Louis, Mo. He has a total of 30 years' experience with the Corps.

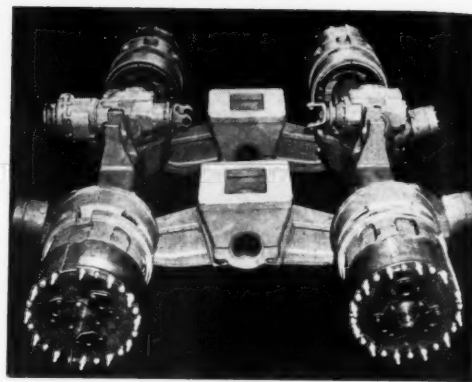
#### Tandem rear axles for crane carriers

■ The first of a line of special-purpose tandem rear axles for rubber-tire cranes is now being offered by the Industrial Brownhoist Corp. The new axle assemblies are intended primarily for use with crane carriers rated at 30 tons or more lifting capacity.

One assembly—the Model 440, designed for cranes of 30 to 50 tons rating—is now in production, and a Model 460 for cranes up to 100 tons will be available soon.

The Model 440 employs a conventional differential center unit combined with a planetary wheel end for final reduction to produce over-all axle ratios of 17 to 42. This planetary axle construction reduces the loads

The Model 460 tandem rear axle, scheduled to go into production soon, is for crane carriers of up to 100 tons capacity.



and stresses on all drive line components such as propelling shafts, universals, and differentials, thus eliminating failures due to overstressing.

The Model 440 axle assembly has a nominal capacity of 100,000 pounds.

The load-carrying housing is a heavy-alloy-steel casting, heat-treated for highest strength, and provides integral supports for rubber-mounted rocker beams.

For further information write to

## LOOKING FOR THE LOWEST-COST TRUCK?

Take a tip from  
the men who  
buy trucks  
every  
year!



# Big fleets buy more Ford



"Our 27 Fords average 5½ miles to the gallon," say cement haulers of Material Transportation Company, Harlington, Texas. "Oil economy is good, too. Our F-800 and F-900 Big Jobs average 125,000 miles before we drop the pan. Fords are the most economical and satisfactory trucks we've ever used."

The big fleets keep complete cost records. They know which trucks cost less to buy and run. And official R. L. Polk registration figures PROVE FORD IS THE FAVORITE!

Take a look at these pages. These leading companies are just 4 out of thousands that find Ford trucks cost less to buy, less to run—and are "tops" for all-round economy.

The "men who buy trucks every year" take everything into consideration . . . Ford's stronger chassis for low oil and gas consumption . . . Ford's stronger chassis for longer life (insurance actuaries prove Ford trucks last longer) . . . and Ford's higher resale value. So—from Pickups to 65,000-lb. GCW Big Jobs, the big fleets are going Ford. You agree Ford Trucks cost less—when you see a Ford Dealer.

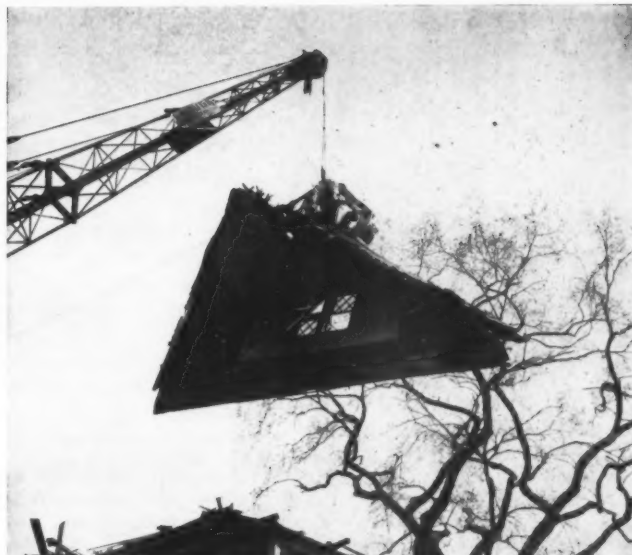
Industrial Brownhoist Corp., Washington St., Bay City, Mich., or use the Request Card at page 18. Circle No. 76.

### Multipurpose hose

■ Allflex, a horizontal braided mandrel-made hose, is presented in a mailing piece from Manhattan Rubber Division, Raybestos-Manhattan, Inc. The uses of the hose—for air, water, oil, gas, spray, and chemicals—are listed in a table. The specifications chart states that hose is available in sizes from  $\frac{3}{8}$  to  $1\frac{1}{2}$  inches. Construction features are detailed.

To obtain the mailing piece write to Manhattan Rubber Division, Raybestos-Manhattan, Inc., 92 Townsend St., Passaic 2, N. J., or use the Request Card at page 18. Circle No. 52.

HANDLED BY A CRAWLER CRANE, this Ruhr 4/5th-yard-capacity heavy-duty wide-tine grapple quickly demolishes residences and other buildings in a six-square-block clearing project. Here the grapple lifts away the entire peak of a house. The grapple also handles large chunks of brick wall and steel beams with little effort, according to the manufacturer. Frouge Construction Co., Inc., Bridgeport, Conn., is using the grapple on this large-scale demolition job. For more details on the grapple write to Ruhr Industries, 1411 Walnut St., Philadelphia 2, Pa., or use the Request Card at page 18. Circle No. 127.



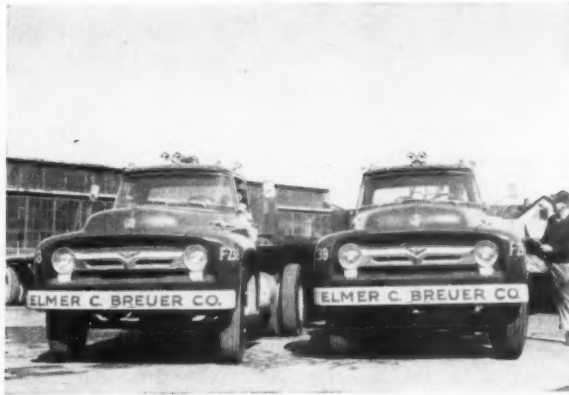
"Our 300 Fords cost less to run," says Johnson, Drake and Piper Inc. of N. Y. City, world-wide contractor and owner of F-800 BIG JOBS. "We've tried all makes but

our records show that, when all factors are considered, Ford Trucks cost less. Low running costs. Low purchase price. High trade-in value."

# Cost less than any other make!



"102 Fords last longer," says David L. Brown, Lessee contractor and owner of Ford T-800 BIG JOBS. "For kind of work, we need a truck that can take a real beating and keep on going. We have a Ford that's been running for 5½ years without a motor job—and it's still going!"



"Our 30 Fords are easiest handling," says Elmer C. Breuer, Cleveland steel hauler. "Maneuvering our Ford F-900's in tight spots is timesaving and easy. And with that Power Steering our drivers finish fresh after a tough day's work. We're staying with Ford because they give us fast, dependable service."

## FORD TRUCKS COST LESS—LAST LONGER

Using latest license registration data on 10,502,351 trucks, life insurance experts prove Ford Trucks last Longer.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 237

### New materials tower rotates 360 degrees

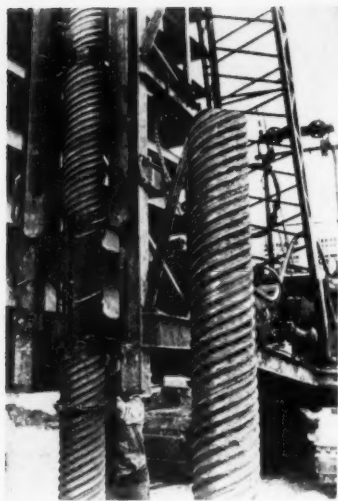
■ A swivel-base materials tower for use with the company's mobile hoist has been announced by the Campbell Equipment Co. The Trail-Erector rotates a full 360 degrees and is locked into place when the hoist is properly positioned to dump materials at working level.

The swivel model is used with a curved-top Lad-E-Vator mobile hoist and a scoop or skip platform for dumping materials at any level up to 80 feet. Since the base swings to any position, it is necessary only to tow the Lad-E-Vator to a position adjacent to the building. One man can position the rig and have it ready for operation in 10 minutes, according to the manufacturer.

The unit is driven by either an electric or gasoline engine permanently installed on the Trail-Erector platform. When the unit gets to a job, the swivel base is released, swung into position, and locked; leveling legs are dropped; and the rig is ready for operation. The weight of the hoist and the tower combined is less than 2,000 pounds. It rides on a pair of 6.40 x 15 pneumatic tires and can be towed by a light truck or passenger car, the company reports.

For further information write to the Campbell Equipment Co., 2122 N. Menard Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 160.





## Foundation for plant housing heavy equipment built in sand fill area

A workman unloosens the chain on the mandrel after one of the Armco Hel-Cor pile shells has been driven about 25 feet to resistance. A total of 4,000 of the piles, with a 12¼-inch outside diameter, was required for the plant addition.



## Set your sights on an Allis-Chalmers HD-6G



**"ALLIS-CHALMERS HAS A GREAT TRACTOR HERE...**  
**we like our HD-6G for its low cost, big**  
**output, easy transport and simple operation"**

*Joe Brown, Ratliff City, Oklahoma*

Working on all kinds of jobs, large and small... keeping 9 trucks and 5 Allis-Chalmers tractor shovels busy, that's the Joe Brown Company. Read what owner Joe Brown says about his new Allis-Chalmers 1½-yd HD-6G:

"Working with two trucks on a recent road job, our 6G moved 700 yards of big rock in one day. In dirt

it does even better. The tracks are heavy and long, and power is well coordinated with the bucket. All this means real economy to us; we're profiting with the 6G."

Kenneth Chromieter, HD-6G operator, says: "I like the visibility; and the engine is terrific." And speaking of bucket capacity and strength, Chromieter added, "You know, we had rocks in this bucket they wouldn't let me dump on

the trucks. It sure can do the job."

Yes, the HD-6G "sure can do the job." Stories like this from owners and operators are coming in from all over the country to prove it.

Let your Allis-Chalmers construction machinery dealer demonstrate the 6G for you... show you all the exclusive advantages that will help you get top performance and big production on your jobs.

**HD-6G**  
**1½-yd bucket**  
**55 belt hp**  
**19,600 lb**

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

**ALLIS-CHALMERS**



For more facts, use Reader-Reply Card opposite page 18 and circle No. 238

Constructing plant buildings that will house heavy equipment, and doing it on delta land and silt that was formerly marsh land or completely under water, made for difficult foundation problems for the contractor on a new addition to the Mobile, Ala., plant of the Hollingsworth & Whitney Division of Scott Paper Co. Using heavy foundation piling driven by a mechanically expanded mandrel, Hercules Concrete Pile Co., Ridgefield, N. J., is providing adequate bearing strength for the buildings.

The \$21 million installation, expected to be completed in January, is being built as part of the Scott expansion program, which ultimately will provide the firm with two new paper-making buildings, each housing two machines; a new recovery boiler; a new warehouse and warehouse building; a new converting facility; additional pulp mill facilities; and a new installation for pulping gumwood. All this will completely integrate plant operations.

### Piling supports machines

The site of the new addition, the northern end of Mobile just above the mouth of the Mobile River, was marsh land until it was filled in with sand some years ago. In this old delta area, bedrock is virtually unknown. And since the site was several feet lower than adjacent areas, dewatering pumps had to be kept in operation during the course of the work.

To provide enough support for the structures, the contractor drove about 4,000 Armco Hel-Cor pile shells—12¼-inch outside diameter pipe of 18 gage thickness—to a specified load bearing of 40 tons per pile. In one area 50 wood piles were also driven for support.

About half the piling was driven under the paper machine buildings; the remainder was driven under the other structures. The piles went down either in columns of 2 to 6, or in clusters of about 25 spaced 3 feet center to center.

The driving operation was conventional, two Vulcan No. 1 hammers being used to get the piles down. A mechanically expanding 40-foot mandrel, designed by C. B. Hoppe, was also used in this work. Piles were driven to resistance measured by 4 hammer blows to the inch. After they had been driven to depths of 24 to 25 feet, they were cut off to grade and closed by a flat cap that was welded onto the end of each. THE END

### Hydraulic research book

Information from reports by hydraulic and hydrologic laboratories in the United States and Canada has been compiled in a new book, "Hydraulic Research in the United States," edited by Helen K. Middleton. Data is given on current projects.

Priced at \$1.50, the book was published by the National Bureau of Standards of the U. S. Department of Commerce and is available through the U. S. Government Printing Office, Washington 25, D. C.

CONTRACTORS AND ENGINEERS



The Fageol Model B all-steel barricade with two Model HD-2 Flasher safety lights provides efficient traffic-hazard warning for highway construction and repair operations.

### All-steel barricade for road repair jobs

■ A new all-steel folding traffic warning barricade, for use with the firm's Flasher safety lights, is announced by the R. D. Fageol Co. The Model B barricade is recommended for traffic control around hazardous areas on construction and road-repair jobs.

Finished in highway safety yellow or white and black, the Model B is used with Flasher safety lights after dark. Reflector tape is also available. The battery-powered safety lights produce neon flashes, visible for more than 1 mile, at a rate of 90 per minute, according to the company.

The barricade has a one-piece heavy-gage steel body, with folding angle-iron legs secured by toggle locks. Mounting brackets for the lights also enclose the toggle leg locks and prevent collapsing of the barricade by vandals. The 3-foot-high barricade is available in either 4 or 5-foot lengths.

For further information write to the R. D. Fageol Co., Box 328, Kent, Ohio, or use the Request Card at page 18. Circle No. 24.

### Utility spray tank

■ Littleford Bros.' Model 101 utility spray tank is featured in a bulletin. The unit combines three operations in one—bar-spraying, hand-spraying, and a pouring pot outlet for patching and crack filling. Design, construction, and operating advantages are described.

To obtain Bulletin GG-5 write to Littleford Bros., Inc., Box 97, 485 E. Pearl St., Cincinnati 2, Ohio, or use the Request Card at page 18. Circle No. 136.

### Diesel-powered towboat

■ Dravo Corp.'s Ram towboat for sand and gravel operations and marine construction work is described in a bulletin. Action shots show the 580-hp diesel-operated boat at work on canals, waterways, and rivers. The specifications chart states that the 70-foot long boat can accommodate a crew of eight.

To obtain Form 250-128 write to the Dravo Corp., Neville Island, Pittsburgh 25, Pa., or use the Request Card at page 18. Circle No. 35.

### Expand line to include 40, 50-ton hoist hooks

■ J. H. Williams & Co., manufacturer of industrial and automotive wrenches, tools, and drop-forgings, has extended its hoist-hook line to include 40 and 50-ton-capacity sizes.

Forged in closed dies, these hooks are reported to bring a new degree of accuracy, safety, and uniformity of design to the heavy-capacity range of shank pattern hoist hooks.

To insure proper service at listed capacity, each hook, after heat-treatment, is proof-tested on a standard tension machine to 50 per cent beyond its safe working load, according to the manufacturer.

For further information write to J. H. Williams & Co., 400 Vulcan St.,



Buffalo, N. Y., or use the Request Card at page 18. Circle No. 109.

## Gardner-Denver... Serving the World's Basic Industries



Gardner-Denver Air Trac®—this self-propelled crawler-mounted drill packs a punch in any terrain. The Air Trac is self-stabilizing, fast drilling.



Gardner-Denver Rotary 600—continuous and reliable air power in any weather... at any altitude. Extra easy to maintain in the field. Easy on fuel.

### Contractors say:

"Rugged jobs were made for Gardner-Denver"



Gardner-Denver wagon drills—they're hard hitting, mobile, easily positioned for accurate hole-spotting. Readily handle angle holes, toe holes, line drilling.



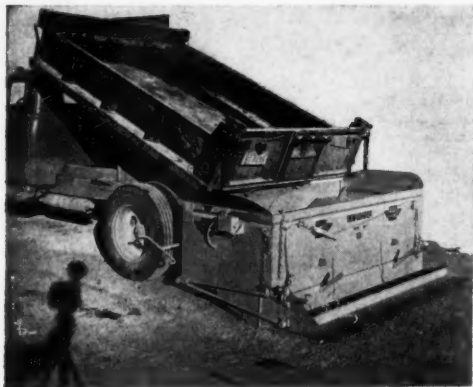
Gardner-Denver S48—fast-drilling sinker.



## GARDNER - DENVER

THE QUALITY LEADER IN COMPRESSORS, PUMPS, ROCK DRILLS AND AIR TOOLS FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY

Gardner-Denver Company, Quincy, Illinois



### Lift thickness measured by scales on spreader

■ A new bituminous concrete and aggregate spreader with a scale at each end of the screed is announced by Highway Equipment Co., Inc. The accurate scales on the New Leader Model AS spreader permit the operator to make the correct setting for the thickness of the lift he desires, the manufacturer states.

The 1956 version of the New Leader has an increased wheelbase, allowing the floating screed to travel on an even plane. The screed can be quickly locked into a fixed position for the proper depth desired. Another feature noted by the company is an improved hook-up arrangement for carrying the unit on the back of the dump truck, off the ground, from one job to another.

For further information write to the Highway Equipment Co., Inc., 616 D Ave. N. W., Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 103.

### Highway signs

■ Various sizes and shapes of aluminum highway signs are described in a catalog from Kaiser Aluminum & Chemical Sales, Inc. Information is given on the design features and economies of the signs. Data is included on the methods of finishing aluminum sign panels by applying reflective sheeting, paint, baked enamel, and porcelain enamel.

To obtain the catalog write to Kaiser Aluminum & Chemical Sales Corp., Consumer Service Division, PR856, 1924 Broadway, Oakland 12, Calif., or use the Request Card at page 18. Circle No. 142.

### Bituminous mix plants

■ Three sizes of Continuflo bituminous mix plants are described in separate bulletins from Pioneer Engineering Works, Inc. They state that the Model 51 has a capacity from 40 to 60-cubic yards per hour; the Model 81, 60 to 80-cubic yards per hour; and the Model 102, a maximum capacity of 150 cubic yards per hour. A cutaway spread of each plant shows how the materials flow through the plant. The design and construction of component parts are explained.

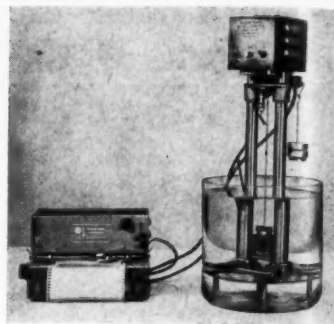
To obtain Forms No. 619A, 653A, and 658 write to Pioneer Engineering Works, Inc., 1515 Central Ave. N. E., Minneapolis 13, Minn., or use the Request Card at page 18. Circle No. 57.

Scales at both ends of the screed on the New Leader Model AS spreader enable the operator to accurately control the depth of the spread.

### Instrument determines durability of asphalts

■ A new instrument that is said to make possible accurate predictions of the life expectancy of asphalts is available from Hallikainen Instruments. A sliding plate microviscometer, the instrument measures the viscosity of asphalt under carefully controlled temperatures and shear forces.

Accurate measurements permit the selection of asphalts with the proper viscosity and a great resistance to change, thereby aiding in the construction of uniformly superior as-



phalt roads. The key to precision is that measurements are made on an extremely thin film of asphalt—about 1/100-mm thick. This is the thickness



**WORKING IN SOFT OR RAIN SOAKED SOIL** presents no problems for owners of sure-footed American cranes. When the going gets really tough they depend upon the

extra-wide crawler pads, generous power, amazing stability and the fast, accurate control system of American Cranes to produce more on *any job anywhere!*

**Working at Extreme Radius—180° Swing . . .**

**AMERICAN DRAGLINE AVERAGES 140 YARDS AN HOUR!**



The story of the Monona-Harrison Drainage District of Iowa is one of high production. Recently, their American 300 Series Crawler Crane cut a new channel 1000 feet long, 20 feet deep and 100 feet wide. The 300 Series was rigged for dragline—equipped with a 50-foot boom and a 1-yard drag bucket. Even though it was working at extremely long radius and swinging 150 to 180° on every pass, L. C. Bennett, district engineer, reported that the American produced an average of better than 140 yards every hour in moving an estimated 44,500 yards of dirt!

When you can get top crane performance like this everyday regardless of soil conditions, you know your tough jobs will go on without delay. If you're erecting steel, handling concrete or other construction materials, ditching, excavating or filling, you can rely on American Cranes!

**HERE'S WHAT WAYNE TURNER SAYS:** "Our American has exceptional stability and traction in river slope work." Turner, who is the District's crane operator, has 25-years' experience in crane handling.

of asphalt that binds stones together in streets and roads.

Using such samples, scientists are able to run tests under conditions similar to those existing in ordinary pavements. Earlier tests, made on thick layers of asphalt, reportedly gave results that had little or no relation to the performance of asphalt as it exists in typical pavements.

The new instrument was developed by the Shell Development Co., research affiliate of the Shell Oil Co.

For further information write to Hallikainen Instruments, 1341 Seventh St., Berkeley 10, Calif., or use the card at page 18. Circle No. 7.

## Tractor-shovel

■ The outstanding features of the Drott Skid-Shovel are described in a mailing piece. Some of the features listed are the pry-over-shoe breakout action, the depth-gage indicator, and the shock-swallowing protection of the Hydro-Spring. Job photos accompany the descriptions. Also pictured and described are other Drott front-end attachments.

To obtain Booklet CR-407-F write to Drott Mfg. Co., 3841 W. Wisconsin Ave., Milwaukee 8, Wis., or use the Request Card at page 18. Circle No. 133.



The new Wooldridge Cobra Quad scraper.

## Introduce new 26-yard self-propelled scraper

■ The new Wooldridge Cobra Quad, boasting a heaped capacity of 26 cubic yards, is said to be the highest capacity three-axle self-propelled scraper available, according to an announcement by the Wooldridge Mfg. Division of Continental Copper & Steel Industries, Inc.

Comprised of a 300-hp diesel four-wheel tractor with a two-wheel scraper attached through a heavy universal ball-and-socket yoke connection, the unit is rated at 20 cubic yards struck, with load-carrying capacity of 56,000 pounds.

A fluid coupling drive is said to provide smoother operation, easier shifting, and minimum strain on the power train. Air actuation of clutch, transmission, and winch; hydraulic steering; foam-rubber cushioned adjustable air-ride seat; and stability of four-wheel tractor design reportedly offer maximum ease of operation, safety and comfort for the operator.

Wide-base 29.5 x 29 tires of 28-ply rating on the scraper and tractor rear wheels are interchangeable and are reported to offer ample traction and flotation for full capacity loads under all operating conditions. The unit is reported to be unusually maneuverable, making a non-stop 180-degree turn in 38 feet through use of steering brakes.

Ruggedness is reflected in the unit's weight of 63,400 pounds. An extra-heavy-duty helical-gear synchro-mesh transmission provides nine speeds forward and two in reverse, with haul speeds over 32 mph.

For further information write to the Wooldridge Mfg. Division of Continental Copper & Steel Industries, Inc., Sunnyvale, Calif., or use the Request Card that is bound in at page 18. Circle No. 80.

## Koehring effects merger

A combined venture to merge activities dealing with the manufacture and sale of machinery used by cross-country pipeline constructors has been agreed upon by the Koehring Co., Milwaukee, Wis., and Crutcher-Rolls - Cummings, Inc., Houston, Texas. Under the terms of the arrangement, Koehring will acquire the designs and manufacturing rights to the C-R-C Big Incher and Middle Incher cross-country digging machines, which will be manufactured by the Parsons Co., a Koehring subsidiary in Newton, Iowa.

C-R-C will sell both ditching machines, Koehring excavators, and the Parsons Trenchliners.



WITHOUT CONSTANT MAINTENANCE, rivers and beaches erode, banks wear away and fall into the water. Flood danger is increased and valuable soil lost downstream.



AFTER REBUILDING, banks in the Monona-Harrison District look like this. Erosion losses and flood damage have been greatly reduced as a result of the program.

AMERICAN'S COMPLETE LINE of crane-excavators starts with the surprisingly low cost Series 100—a compact machine that owes its long, dependable life to heat-treated alloy parts that "take a beating" every day. The versatile 100 Series operates at peak efficiency with any front—a real profit maker! On crawlers, the American 100 rates a full 1/2-yard capacity. On rubber tired chassis, it offers up to 15-ton capacities.

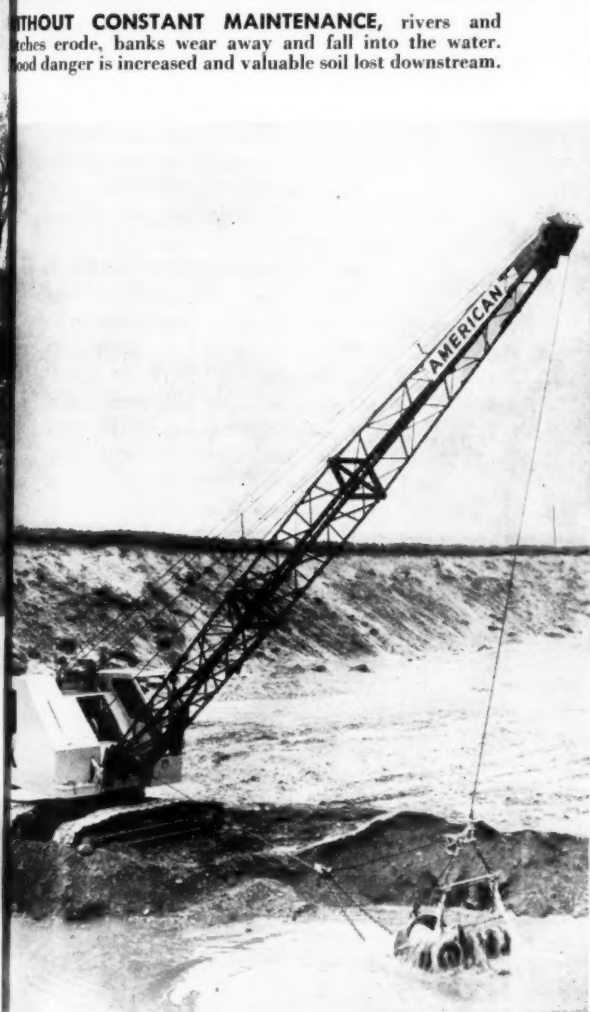


BIG, BIG BROTHER of the American crane-excavator family is the famous 700 Series. On crawler or rubber it rates as a 2-yard dragline, 1 1/2-yard rock shovel or backhoe. For steel erectors: 50-ton crawlers, 45-tons on rubber. And the big 700 Series isn't musclebound, its finger tip air controls speed up every movement. Investigate, you'll find you move more, faster with an American of any size!

## AMERICAN HOIST and Derrick Company

St. Paul 1, Minnesota

For more facts, use Reader-Reply Card opposite page 18 and circle No. 241



For more than three-quarters of a century, American machines and products have been chosen first for the biggest and hardest jobs in the world! You get full advantage of this outstanding record of service, experience and know-how when you buy American!

Detailed information on American Crawler and Truck Cranes is available at your nearby American Distributor, or write American Hoist & Derrick Co., St. Paul 1, Minnesota.



Hilly terrain like this made the going rough for all the pipeline crews. Caterpillar D8's with side booms are getting the line ready along the right-of-way for the welding crews.

## Small pipeline job proves as tough as some larger ones

Construction of a 75-mile small-diameter pipeline for a gas gathering system can sometimes be as difficult as construction of a transcontinental transmission line.

R. H. Fulton & Co., Lubbock, Texas, is finding this out again in its current job on a system in the San Juan basin of southwest Colorado and northwestern New Mexico, part of a project that includes a main transmission facility that is under construction between the San Juan basin and the Pacific Northwest. Fish Northwest Constructors, Inc., the controlling contracting agency, is supervising the big project and serving as agent for the owner, Pacific Northwest Pipeline Corp. The Fulton firm, with a spread working at Pasco, Wash., is also among the contractors working on this main line.

The gas-gathering line being built by Fulton runs through the mountainous terrain between Ignacio, Colo., and Aztec, N. Mex. Aside from the usual quota of supply and logistic problems, this job will require that four river crossings be made when water is running high in the streams.

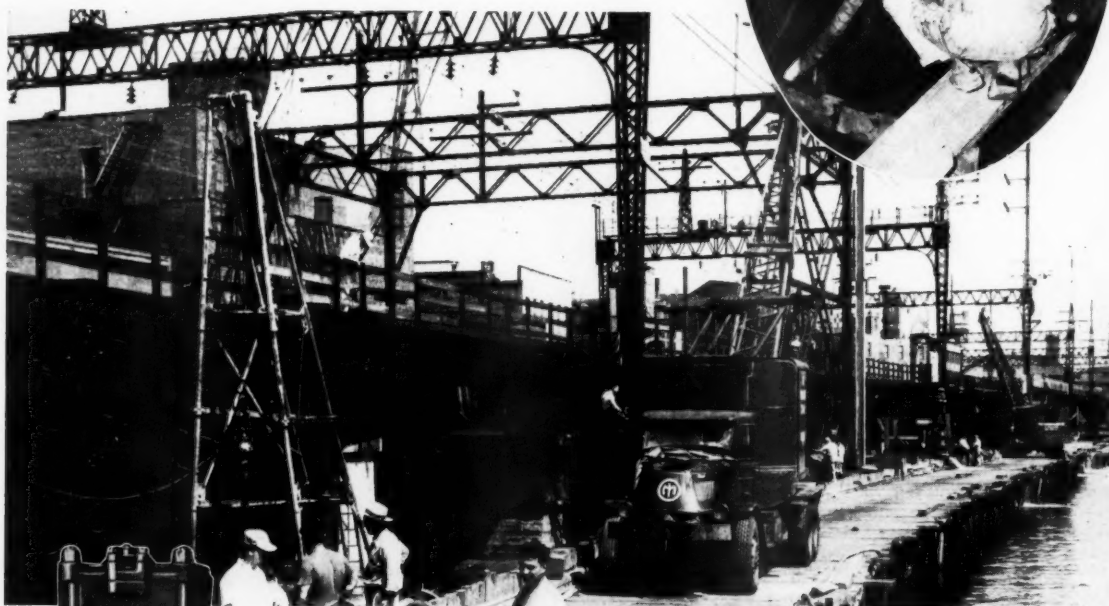
To organize the work so that it would move as rapidly as possible, spread superintendent Chuck Siewert based the outfit in Aztec, N. Mex. Housing facilities here are cramped, and the location requires long daily hauls of men and supplies, but even Aztec is a better base than Ignacio.

The Aztec headquarters is staffed with an office man, and the assistant spread superintendent helps by acting as an expediter. Like other field offices for Fulton spreads, this one is virtually self sufficient when it comes to field purchasing, personnel, and payroll preparation. Equipment for the spread was selected by Siewert and Clark Williams, a widely-traveled superintendent for Fulton.

### Prepare right-of-way

Right-of-way preparation for the first phase of this job, a 40-mile 4-inch liquid line, required only minor road-building operations. The liquid line, which will return bleed-off moisture to the refinery for reprocessing so that both gas and water can be saved, was put down on a right-of-way where a 30-inch line had already been located. This 30-inch main transmission line was fully charged

## Bridge Restoration under "impossible" conditions with the help of McKiernan-Terry Pile Hammers



When The Foundation Co. of New York tackled the job of constructing new supports for the 740-ft. New Haven R.R. viaduct at Bridgeport, Conn., they found obstacles that challenged their utmost skill and ingenuity.

New support piers consisting of 117 concrete-filled 48-in. dia. steel caissons had to be driven in 6-ft. sections through a maze of rock, old ties, timbers and piling into solid bedrock below an 8-ft. tide, and with practically no headroom for driving. Operations could not be allowed to interrupt regular train service on one of the busiest railroads in the country, and the area overhead was crossed and crisscrossed by 10,000-volt power lines.

The pile-driving problem was

solved by using McKiernan-Terry 10B3 Double-Acting Pile Hammers hung from the existing bridge girders, and operated from a wooden work trestle built by the contractor alongside the structure. The powerful hammers sank the caissons rapidly; and in spite of all the handicaps of cramped working quarters and extremely difficult construction conditions, the job was successfully completed with greatest credit to the contractor and construction bosses, J. J. O'Laughlin and Carsten Anderson.

Whether your own pile-driving operations are unusual or routine, it will pay you, too, to depend upon McKiernan-Terry equipment. Write for bulletins.



**McKIERNAN-TERRY CORPORATION**  
MANUFACTURING ENGINEERS  
82 Richards Ave., Dover, New Jersey

For more facts, use Reader-Reply Card opposite page 18 and circle No. 242

MK 371

CONTRACTORS AND ENGINEERS



Two Caterpillar D8 tractors with dozers and heavy single-tooth rippers smooth a pathway for other rigs. Heavy brush and trees in this stretch have already been burned.



The easiest digging in the 75-mile job is done by a Cleveland 320 ditcher in farming country. Tougher digging in the mountains was handled by dragshovel after the material had been drilled and blasted.

with gas before the liquid line was constructed, so strict safety precautions were taken to finish this part of the job without puncturing the larger pipe.

The remaining 35 miles of the gathering system, consisting of 16, 10, 8, 6, 4, and 3-inch-diameter lines, is being built at the 7,000-foot elevation where pinion pines and similar trees have to be cleared. Four Caterpillar D8's, each equipped with a dozer blade and a heavy-duty single-tooth rock ripper, are stripping a 50-foot swath of growth, then piling the trees for burning. This done, they use blades and ripper teeth to make a smooth pathway for the tractors and other equipment installing the line.

If the terrain is good enough, haul roads are built for pipe-stringing trucks, pickups, and other equipment. In places where slopes are too steep, tow Cats are used to get pipe-stringing equipment to the site.

#### Pipe stringing

Pipe-stringing is being done by Fulton foreman John Houston working out of Albuquerque, N. Mex. The 40-foot pipe joints, fabricated by Lone Star Steel Corp. in Houston, are shipped by rail to the Albuquerque staging points, where they are unloaded by Cat D7's with side booms. A small crawler crane loads the 15 stringing trucks that keep busy shuttling the 170 miles between Albuquerque and the job site.

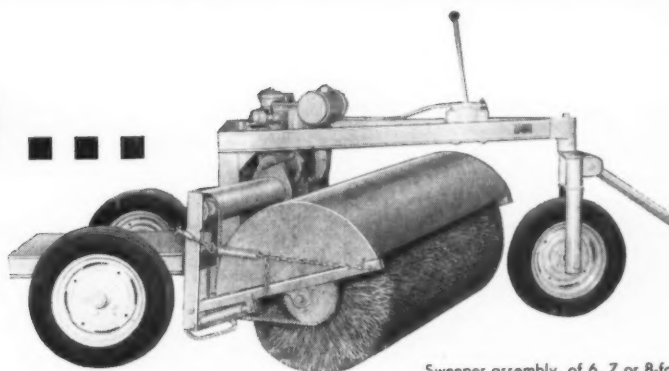
Whenever possible, tow Cats help the loaded machines through all the bad spots near the right-of-way. If this cannot be done, Caterpillar tractors use winches to pull the trucks to their destination. Joints are unloaded on one side of the ditch, and excavated material is dumped on the opposite side, giving crews as much room as possible to do their work.

#### Excavation varied

Ditching is being done in material that ranges from topsoil in farming valleys to solid rock in the mountainous part of the right-of-way. Easier digging is handled by two Cleveland 320 ditchers with endless bucket lines equipped with H&L replaceable teeth. In good country, these machines dig a mile of trench daily for 16-inch line.

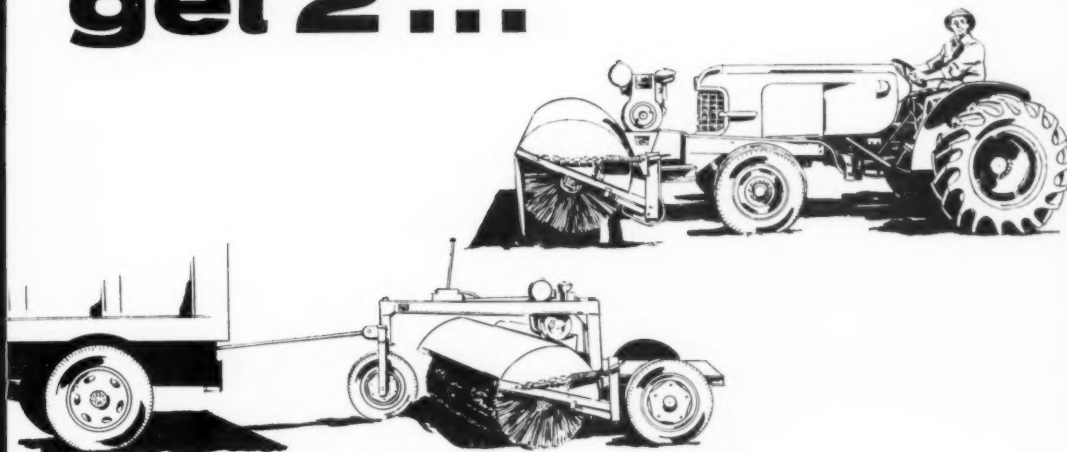
(Continued on next page)

# buy 1 ...



Sweeper assembly, of 6, 7 or 8-foot brush AND 8 HP engine, is easily attached or detached as a unit by removing one pin. Mounting plate permits angling of brush 30°.

# get 2 ...



**1 Little Giant Road Bird Sweeper + 1 Set FM-C Mounting Brackets = 2 Versatile Sweeper Combinations.**

Buy one Little Giant Road Bird with one set of mounting brackets and you get two different types of sweepers that can meet any of your sweeping needs.

Use the complete Road Bird, with truck, Jeep or tractor, as a tow-type sweeper . . . or use the independently-powered Road Bird sweeper assembly, with brackets mounted

on truck, Jeep or tractor, as a front-mounted sweeper.

With one sweeper you have the exact type for whatever prime mover you have available.

Ask your Little Giant distributor for more information on the profitable, convertible Road Bird Sweeper . . . or write direct.



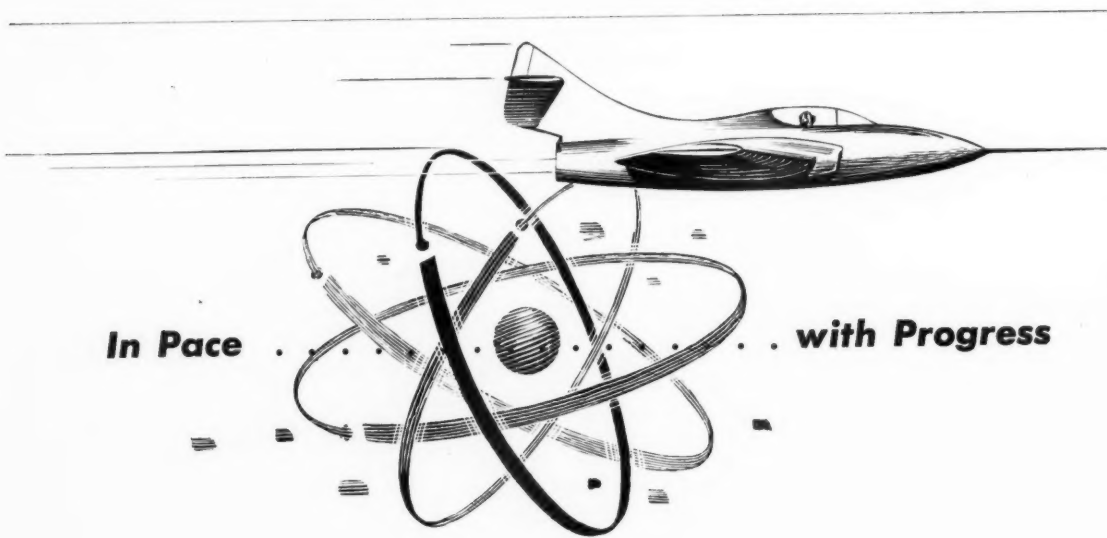
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PRODUCTS, INC.**  
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*Manufacturers of quality products since 1918*

For more facts, use Reader-Reply Card opposite page 18 and circle No. 243



Working just behind the pipe-laying crew, welders use Lincoln 300 machines to join the 40-foot sections. Welding machines, mounted on Athey crawler wagons, are towed by Cat D7's.



## True GUN-ALL

Wet-mix pneumatic concrete

- UP TO 4 CU. YD. IN PLACE PER HOUR
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**TRUE GUN-ALL EQUIPMENT CORPORATION**

P. O. Box 2526 • Tulsa, Oklahoma

For more facts, use Reader-Reply Card opposite page 18 and circle No. 244

(Continued from preceding page)

Equipment capable of getting through the hardest formations is concentrated in the mountainous section of the right-of-way. Drilling equipment includes two Gardner-Denver multiple drill sets. One rig has three drills, the other has two. Air is supplied by two Gardner-Denver 600 air compressors, and Timken rock bits are being used without tungsten-carbide inserts to put down the 6-foot blast holes. These are bottomed at a 2¼-inch diameter and loaded with Du Pont 40 per cent powder.

Three Bucyrus-Erie dragshovels—two 22-B's and a 15-B—together with a backhoe are excavating rock from the trench. Most of the time, these machines work under their own power; holdback Cats are hooked to them on the steep slopes.

### Bending and welding

Because the terrain is so rough, a considerable amount of the pipe has to be bent. After the bends have been figured by surveyors, pipe is shaped in a C-R-C bending machine. Two Caterpillar D7 tractors handle the sections at the bender.

Lincoln welding machines are being used to join the pipe. Lincoln 250 machines, mounted on sleds and towed alongside the ditch by an International TD-14 tractor, are supplemented by Lincoln 300 welders. The latter, mounted on Athey crawler wagons that are moved around with the assistance of Caterpillar D7's, include three machines for the tack coat and four machines for the hot pass. Two welders put on the stringer beads.

Three Cat D8's with side booms, handling a Crose cleaning machine, a Crose dope or wrapping machine, and a Littleford 23-barrel dope kettle, are used by the crew that gives the line a multi-ply wrapping of Fiberglas, Kraft paper, and enamel.

Three D8's with side booms have been assigned to the lowering-in job. These machines and a ¾-yard crane with clamshell bucket are also used by the tie-in crew. A D8 with dozer and shovel push backfill in over the pipe, and a D7 follows to complete the job by cleaning up.

### River crossings

When the time comes to make two crossings over the Animas River and another two crossings of the Florida River, Siewert plans to snake pre-assembled pipe across. Even with 6 to 7 feet of water in the rivers, ditch banks, he feels, will hold long enough for the job to be done.

For this work, a sturdy, well-braced sled, 40 feet long and 7 feet high, has been built. A Bucyrus-Erie 22-B dragshovel will be mounted on the sled and two Caterpillar tractors will handle towing bridle lines from the opposite bank of the river. As the 22-B digs into the clay, sand, and boulders of the riverbeds, and casts the material downstream, the Caterpillar tractors will move the sled. Once the trench has been completed across one of the 150-foot streams, the pre-as-

**CONTRACTORS AND ENGINEERS**



The dope gang handles the next-to-last operation. Cat tractors support the line with the side booms as dope is applied from the Littleford kettle and a multi-ply wrapping put on the pipe by a Crose machine.

sembled pipe sections will be quickly pulled into place and tie-ins made.

#### Personnel

Assisting spread superintendent Siewert in the field are assistant superintendent Freeman Talley, and a number of supervisors of special work. Jesse Jett was in charge of right-of-way work; Red Pinkler, ditching; W. E. Dodge, bending; Red Mitcham, pipe; E. V. Enis, welding; Harley Burkhammer, dope gang; Babe Wimberley, tie-in; Bucky Dixon, cleanup; and Nelson Rost, parts expeditor. Truman Clayton is office man for the spread and O. F. Roberts and T. M. Thomas, mechanics. The chief inspector for the project for Fish Northwest Constructors is A. L. Jones. THE END

#### Air-operated jack can lift nine tons

■ An air-operated truck jack is available from Branick Products Co., Inc. The handle of the rig adjusts for wheeling the jack to the working area and folds to a vertical position to save floor space when the jack is not in use.

The axle raises to its full 20½-inches height in 15 seconds. In the down position, the jack stands 10¼ inches high. With 160 pounds jack air pressure, the unit will lift 9 tons. It will lift 5 tons with 100 pounds pressure.

For further information write to Branick Products Co., Inc., 1213 NP Ave., Fargo, N. Dak., or use the Request Card that is bound in at page 18. Circle No. 20.



The Branick jack will raise 9 tons with 160 pounds of jack air pressure.

#### Photocopying machine is handy office unit

■ The Dial-a-matic Auto-Stat photocopying unit is recommended by its manufacturer as a means of eliminating copy typing and its resulting fatigue to clerical employees in construction and engineering offices. According to the American Photocopy Equipment Co., 30 per cent of all office typing involves the copying of existing manuscripts and carries with it more than its proportionate share of fatigue-producing factors.

The Auto-Stat will reproduce drawings, charts, specifications, and tables, as well as correspondence. Unlike a typist, it cannot make a copying mis-

take. Instead of abetting fatigue, use of the desk-top photocopying machine produces what Apeco terms a "productive work pause."

More than 2,000 separate motions are involved in copying the average business letter on the typewriter; only 6 motions are necessary to photocopy the same letter.

For further information write to the American Photocopy Equipment Co., 1920 W. Peterson Ave., Chicago 26, Ill., or use the Request Card at page 18. Circle No. 126.

Revenue of New Jersey's Garden State Parkway for the first seven months of 1956 was \$6,972,063. This time last year, it was \$4,904,906.



Satisfied customer Art Martinson (right), president of Denver's Kitimat Corporation, and Phil Smith, Mack salesman. There's real friendship between these two—and no wonder! Mack diesels are giving Kitimat...

## 100% more fuel mileage

The Martinson Construction Company of Denver, Colorado, leases a fleet of trucks from the Kitimat Corporation. Originally, the trucks were gasoline-powered units averaging 3½ to 4 miles per gallon—real "profit killers." Today, Kitimat operates Mack diesels exclusively and averages 8 miles per gallon—for a saving in fuel costs of more than 100%.

As Kitimat president Art Martinson says, "In 1952 we bought our first Mack diesel and got a real lesson in truck economy and performance. Today, we are 100%

Mack—12 mixers, 6 dumpers, and 2 tractors. The fuel savings alone more than justify the higher initial cost of the Macks. Just as important, our Macks give us dependable service, bonus capacities, and lower maintenance costs with a really gratifying minimum of down time."

Why not cut hauling costs and boost your profits with Macks—trucks that are unmatched for operating economy, stamina, and low maintenance? Like other operators, you'll find that you can't afford not to operate Macks. For complete information, contact your local

Mack Branch or Distributor. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

**MACK**  
first name for  
**TRUCKS**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 245



The M & W Ditch-A-Line.

## New hydraulic trencher digs to 20-inch depth

■ The M & W Iron Works Co. is marketing a new Ditch-A-Line hydraulic trencher which digs a 2-inch-wide by 20-inch-deep trench up to 400 feet per hour, depending on the soil type. The mechanism is mounted on crawler tracks which are driven hydraulically.

The self-tightening digging chain is also hydraulically driven, and is designed to discharge debris without breaking the digging chain. The new unit is driven by a 6-hp gasoline engine with a reduction gear and hydraulic drive.

The trencher is 83 inches long, 42 inches high, and 27 inches wide, and

its shipping weight is 425 pounds. Portability of the Ditch-A-Line trencher is said to be a big feature with operators since it can be driven up a plank ramp to the bed of a pickup truck.

The machine is recommended for use in installing gas lines, underground wiring, cable, and water lines, and for digging small irrigation ditches.

For further information write to M & W Iron Works Co., 1928 N. Topeka, Topeka, Kans., or use the Request card that is bound in at page 18. Circle No. 115.

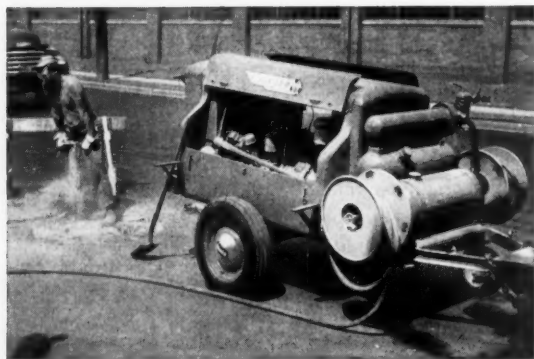


## DRIVING AND EXTRACTING SHEETING WITH 1200 CFM OF JAEGER AIR:

To lay a 6'6" sewer line in Mount Royal, Quebec, Spino Construction and Equipment Ltd. sheeted more than 2000' of trench 30' deep. An average of 100 piles per day were

driven through asphalt and clay by 9B3 hammer operated by Jaeger "600" Rotary compressor. A second Jaeger "600" Rotary operated the E-4 extractor.

## "Smooth as steam" with Jaeger 600 Rotaries



A JAEGER "600" direct connected to a big pile hammer is a striking demonstration of how this modern rotary compressor holds pressure constant under extreme fluctuations of demand. Never before have a compressor unit and its engine been so instantly and closely regulated. Speed modulation is smoothly stepless over the entire operating range. Your Jaeger rotary is also more efficient under all loads, producing its full rated 600 cfm at only 1650 rpm full load speed compared with 1750 to 1800 rpm required by other rotaries.

Smaller Jaeger Roto Air Plus® compressors provide comparable performance. For full details, ask your Jaeger distributor or let us send you Catalog JCR-5.

← JAEGER "125" ROTARY (full load speed only 1700 rpm) has full size tool boxes, retractable pneumatic tired dolly, spring tow eye, many other attractive features.



## THE JAEGER MACHINE COMPANY

701 Dublin Avenue, Columbus 16, Ohio

PUMPS • CONCRETE MIXERS • SPREADERS • FINISHERS • TRUCK MIXERS

## Market aluminum wheel for tubeless truck tires

■ A forged disk aluminum wheel for tubeless truck tires, said to be the first of its kind in this country, has been placed on the market by the Aluminum Company of America.

The one-piece leakproof construction of the new 22.5-inch x 7.50-inch wheel retains all present aluminum advantages in a design which reportedly offers complete compatibility with tubeless tires. Combining round and true rims with high thermal conductivity, aluminum wheels are said to provide easier steering, smoother riding, and lower maintenance costs, coupled with the assurance of cooler running and longer lasting tires. And payloads are hiked because of the lighter unsprung weight.

In addition, the new wheel is said to provide maximum brake drum clearance. The thicker rim sections are machined to assure dimensionally perfect seats for tire beads. The added heft at the rim prevents air loss due to denting or distortion.

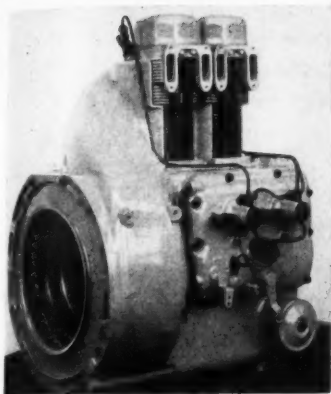
According to the manufacturer, tire changes are easier because the wheel has been constructed so that the "dish" does not interfere with operation of tire irons. Moisture inside the tire will not rust the aluminum rim. On manual changes, tires slip on and off without binding.

For further information write to the Aluminum Company of America, 1501 Alcoa Bldg., Pittsburgh 19, Pa., or use the Request Card at page 18. Circle No. 112.

## Portable core drill

■ The Terebo core drill can be furnished with hydraulic feed or 3-speed mechanical screw feed, according to a bulletin from Acker Drill Co., Inc. The specifications table lists the depth capacity for both feeds as 800 feet. Job photos show the drill mounted on drag skids, jeep, truck, and trailer. Other action shots show power being furnished by air and electric motors, gasoline and diesel engines, and power takeoff.

To obtain Bulletin No. 30 write to the Acker Drill Co., Inc., 721 W. Lackawanna Ave., Scranton 3, Pa., or use the Request Card at page 18. Circle No. 28.



The Deutz Model F2L612 air-cooled diesel is a 20-hp engine recommended for portable pumps, generator sets, and compressors.

### Air-cooled diesels also operate on gasoline

■ Air-cooled diesel engines that will also operate on 90 per cent gasoline are available through the Diesel Energy Corp. The engines are manufactured by Kloeckner-Humboldt-Deutz A. G., Cologne, West Germany.

Deutz engines are manufactured in 5 to 250-hp sizes. They are recommended for use in generating sets, compressors, concrete mixers, shovels, cranes, graders, dumpers, tractors, and other construction machinery. They are also available for use in most types of trucks, including those with 4 and 6-wheel drive.

In addition to operating on any standard diesel fuel, the Deutz power plants can use a 9:1 mixture of low octane gasoline and motor oil (SAE 20 or 30), a 3:1 mixture of low octane gasoline and gas oil, and straight jet-fighter fuel. There is said to be very little loss of power when fuels other than diesel oil are used.

The primary advantage pointed out for the air-cooled engines is the absence of all problems connected with water cooling. These include freezing, leaks in the system, "boiling over" when the engine is straining, evaporation of the coolant, and sludge deposits that cause the system to cool insufficiently.

For further information write to the Diesel Energy Corp., 82 Beaver St., New York, N. Y., or use the Request Card at page 18. Circle No. 26.

### B-K realigns functions at Mattoon, Ill., plant

Sales and manufacturing activities at the construction equipment division of Blaw Knox Co., Mattoon, Ill., have been realigned. Robert P. McKenrick, in charge of operations at Mattoon during the planning and initial production operations, is now vice president in charge of sales of all construction machinery manufactured at Mattoon; Pittsburgh, Pa.; and Elyria, Ohio. With Blaw-Knox for 28 years, and concerned with the development of the construction machinery marketing organization for the past 15 years, McKenrick will continue to make his headquarters at Mattoon.

A. J. Cox, executive assistant to vice president E. C. Rook, has been made division manager of the plant, and will be in charge of all activities, except sales.



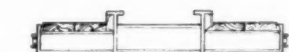
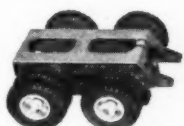
A SLAB OF CONCRETE is lifted into position on a tilt-up job handled by the Philadelphia construction firm of Robert E. Lamb & Sons. The contractor used Visqueen polyethylene film to separate the freshly poured panels. The use of the plastic film was reported to have proven superior to the chemical bond-breakers usually employed. Visqueen is also economical because it can be utilized for temporary closures or as protective tarpaulins for equipment and materials. For more information on the plastic film write to the Plastic Division of the Visking Corp., P. O. Box 1410, Terre Haute, Ind., or use the Request Card at page 18. Circle No. 6.



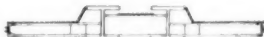
The Talbert Flat Deck is a general all-purpose deck.



The Talbert Flat Deck with telescopic outriggers added is used for loads requiring additional deck width.



The Talbert Raised-Center Deck primarily reduces trailer empty weight allowing more payload.

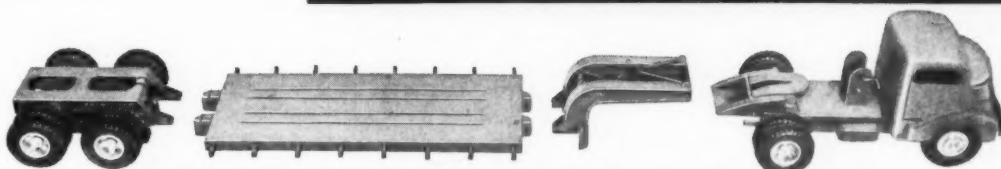


The Talbert Drop-Side Deck facilitates loading and reduces over-all height when transporting heavy cranes and shovels.



The Talbert Beam Deck also reduces over-all height and holds trailer empty weight at a minimum.

WITH *Talbert* TRAILERS®  
YOU SELECT THE RIGHT  
COMBINATION OF COMPONENTS  
TO MEET YOUR SPECIFIC  
HAULING NEEDS



## INTERCHANGEABLE

Different kinds of loads require trailer decks of various sizes and types. The demonstration model illustrated above shows how Talbert Flat Decks, Beam Decks, Raised-Center Decks, and Drop-Side Decks can be interchanged using the same Talbert Removable Gooseneck\* and Removable Rear Axle Assembly. This added Talbert Trailer advantage means more economical and profitable operations flexibility for you.

Standard production Talbert Trailer components, as well as special customized components designed to your specifications, are available at production prices. Talbert Trailers are built in capacities from 10 to 100 tons.

MEMBER OF THE TRUCK TRAILER MANUFACTURERS ASSOCIATION



Note the tandem axle jeep dolly being used with this Talbert Beam Deck Trailer owned by Ft. Lauderdale Transfer.



Rieth-Riley Construction Co. interchanges four different decks using the same Talbert Removable Gooseneck\* and Rear Axle Assembly.



Leroy L. Wade & Son had Talbert customize and build this special deck utilizing interchangeable components from his Talbert Drop Deck Trailer.



The 13 foot deck on this Talbert Trailer owned by Red Top Trucking Co. allows load weight to be transferred forward to the tractor tandem.

### TALBERT CONSTRUCTION EQUIPMENT COMPANY

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Manufacturers of Talbert Low-Bed Trailers and Dump Semi-Trailers

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For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 247





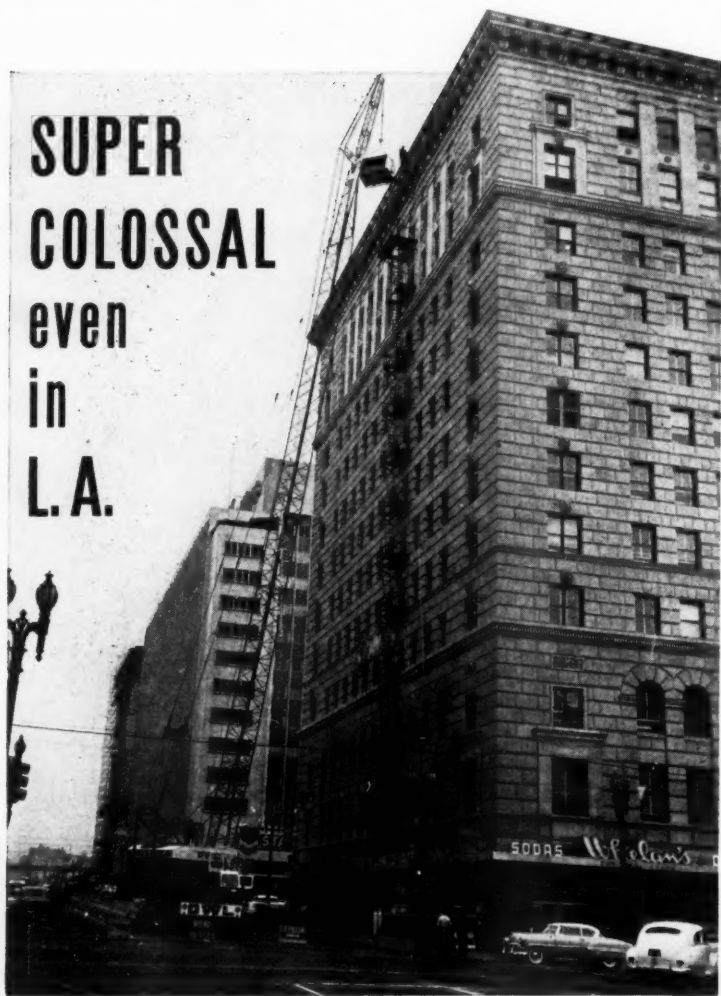
Seven million cubic yards of mud, clay, and rock are moved to link tidal lake with growing Texas port

## Three hydraulic dredges dig tidewater channel

Extending the waterway from Avery Point to Tule Lake, the Shary pumps through 700 linear feet of floating line to the spoil bank. Land lines were handled manually since vehicles could not operate over the muddy flats.

Official U. S. Army Corps of Engineers Photo

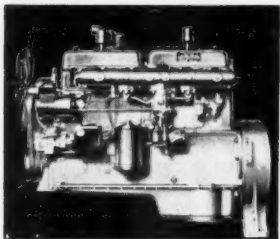
## SUPER COLOSSAL even in L.A.



Los Angeles probably saw its highest hoist—10 tons of refrigeration machinery lifted atop the 12-story Roosevelt Bldg.—by a Waukesha-powered, 50-ton American Hoist & Derrick Co. 795-Crane. The self-lifting boom, with its stinger, was 190 ft. high. The Crane is mounted on a Cook Bros. CT-450 Carrier which is also Waukesha-powered. The Owl Truck & Construction Company of Compton, California, own and operated the crane. The job took only one day, instead of the estimated five days needed with a stiff leg.

## WAUKESHA ENGINES

Powering Crane (boom)—140-GK Waukesha Gasoline, six cylinders, 4 1/2-in. x 5 1/2-in., 525 cu. in. displacement.

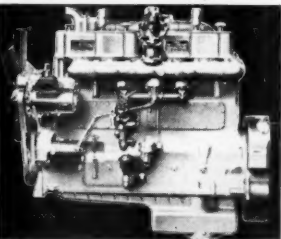


Send for Bulletins 1548 1553



322

Powering the Carrier—145-GKB Waukesha Gasoline, six cylinders, 5 1/4-in. x 6-in., 779 cu. in. displacement.



WAUKESHA MOTOR COMPANY, Waukesha, Wisconsin • New York • Tulsa • Los Angeles

For more facts, use Reader-Reply Card opposite page 18 and circle No. 249

Three big hydraulic dredges, moving a total of 7 million cubic yards of material to dig more than three miles of a new ship channel, have opened a deep tidewater channel from the existing harbor at Corpus Christi into Tule Lake, the large tidal lake lying west of the city.

Bauer-Smith Dredging Co., Inc., Port Lavaca, Texas, had one dredge on the job almost a year; of the other two, one put in three months on the job, the second worked five months.

This work, under a \$1.2 million contract, is part of a project being undertaken by the Galveston District of the U. S. Army Corps of Engineers. The channel, and future improvements in the lake region will provide for almost unlimited expansion of the rapidly growing port facilities in Corpus Christi.

Excavated to a depth of at least 35 feet below mean Gulf elevation, the channel has a 200-foot-wide bottom and 3 to 1 side slopes. Excavated material was discharged on the northeast side of the channel into a tidal flat and this built up area may be used

by industry as the port expands.

Although most of the digging consisted of mud, clay, and sandy clay, at the bottom of the excavation there were reaches of caliche from 3 to 5 feet thick that caused some trouble. This rock was not hard enough to require blasting, but it was too hard to be loosened by the standard basket cutter usually used on these dredges. Special rock cutters with teeth on the blades were substituted for the standard cutters, and these blades scratched and broke up the caliche so that it could be handled by the pumps.

### The dredge John H. Shary

The first rig to move onto the location was the 24-inch hydraulic dredge John H. Shary. Starting work in May, 1955, the dredge stayed on the job for the entire eleven months of this operation, completing excavation work in April of this year.

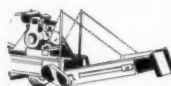
The steel hull of the Shary measures 52 x 175 feet and draws 7 feet of water with a normal operating load. The heavy 75-foot ladder hangs from

*Labor and Time Savings on the Job!*

HANDLE MANY JOBS WITH THESE ATTACHMENTS



Strike-off Box Attachment. For road widening fill and asphalt paving. Adjustable on three sides to 6" above grade. Strike-off blade extends 4". Remove with one pin.



Conveyor Extension Attachment permits backfilling 24" high curb or placing material over 7" from wheels. Take-off drive. Unit is 4' long with independent belt.

Distributors: Write for information on available territories



### POWER-PACK BACKFILLER

Performance proved! Everywhere POWER-PACK has been used great savings result in labor and time . . . also you can expect a better fill with no material wasted!

Only one man operating the POWER-PACK can power-backfill curbing, trenches, and pipelines at the rate of three tons per minute! This equipment has actually paid for itself on a single job.

Ruggedly built for long service. Easily portable with four swivel wheels and a sure, quick hitch. Can be used with any size dump truck including trailer dumps. Dependable 8.25 Wisconsin engine. Heavy duty belt.

To save time and money investigate POWER-PACK today! Write for booklet or phone your distributor.

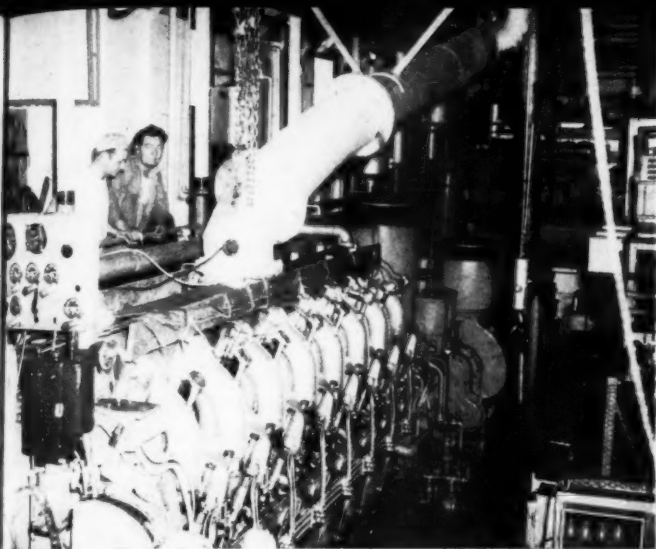
### POWER-PACK CONVEYOR CO.

13910 Aspinwall Avenue

Cleveland 10, Ohio

For more facts, use Reader-Reply Card opposite page 18 and circle No. 250

CONTRACTORS AND ENGINEERS



The main power plant of the Holland is this GM 16 cylinder, 1,440-hp diesel. It drives through a Falk reduction gear box that turns the pump at about 300 rpm with the engine at its governed speed of 750 rpm.

C&E Staff Photo

a heavy A-frame and carries the 7-foot-long 6-blade cutter and a 28-inch suction line. The big basket-type cutter, with 6-foot-long blades, is turned at 22 rpm by a 900-hp electric motor that drives through two reduction stages. The 1¼-inch swing cables and the ladder hoist cables are handled on a 3-drum hoist powered by a 250-hp electric motor.

The 36-inch round steel spuds, 80 feet long, are handled by 1½-inch cables from a 2-drum hoist at the rear of the dredge.

Powering the big dredge pump, and directly connected to it, is a 1,750-hp diesel engine, which runs with a normal governed speed of 230 rpm. The pump used has a 28-inch suction line and a 24-inch discharge line. It was fitted with a 96-inch runner. The pump, mounted inside the dredge superstructure, has the discharge pipe extending out onto the deck on the port side and then back to the Mobile Pulley & Machine Works swivel joint at the rear.

Electric power for the cutter and hoist motors, as well as for lighting

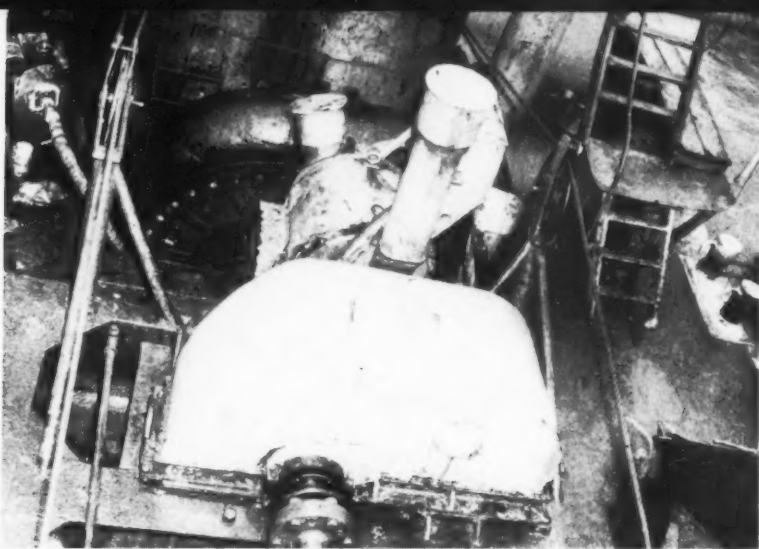
and other purposes, is generated by two GM diesel generator sets. The larger is a 900-hp unit that powers the cutter motor. All other power is supplied by a 500-hp GM diesel driving a Worthington generator.

In the superstructure of the dredge are eating and sleeping facilities for an entire crew, which may number from 20 to more than 40 men. These accommodations were particularly important on this round-the-clock job, for much of the time the crews could get to and from the dredge only by boat.

Pipe landings were made at intervals of about 600 feet. This meant that the dredge pumped through 600 to 1,500 linear feet of discharge pipe to the spoil bank. Of this, 700 linear feet were floating line equipped with Mobile ball-and-socket joints. Land lines were handled almost entirely by hand, since it was almost impossible for a tractor or other vehicle to operate over the muddy flats where the spoil banks were built.

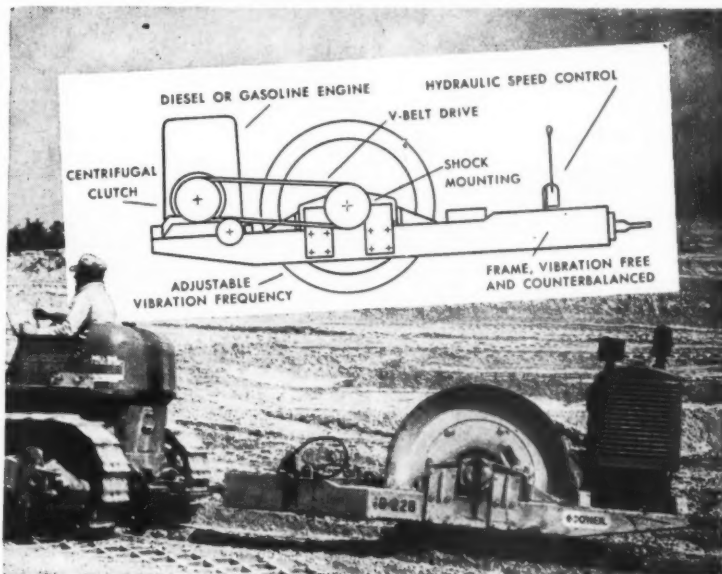
The 5,000-pound anchors attached

(Continued on next page)



The main dredge pump, located ahead of the Holland's superstructure, leaves plenty of headroom available for repair work. Its location also makes water more likely to go overboard in case of a leak in the pump case or discharge line.

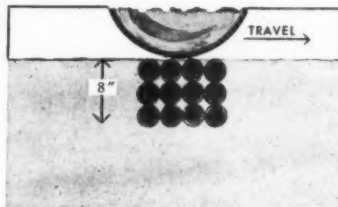
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NEW CONCEPT IN COMPACTION!

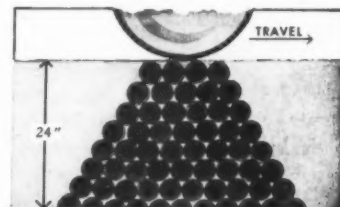
## VIBRO-PLUS TERRAPAC VIBRATORY ROLLER

"Terrapac" compacts faster, better and deeper in fewer passes than ordinary 30-50 ton rollers yet weighs only 3½ tons. Saves hours of valuable time because maximum density can usually be achieved in only 2 passes . . . Light enough to be easily handled on any fill or for quick transport . . . Also useful as a static roller if desired.



CONVENTIONAL STATIC COMPACTION

Rollers relying on weight alone produce friction forces between individual soil particles that prevent densification at any great depth.



TERRAPAC DYNAMIC COMPACTION

Vibratory forces, transmitted to soil in all directions, reduces friction — facilitates relocation of particles at far greater depths.

An actual field test under State Highway supervision showed that a specified 100% standard proctor density could be obtained at a 24" depth after 2 passes with a "Terrapac" . . . A 15 ton smooth roller required 20 passes to obtain specified density at only an 8" depth!



VIBRO-PLUS

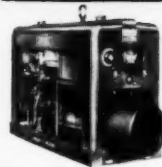
PRODUCTS, INCORPORATED

STANHOPE, NEW JERSEY No. 41-4

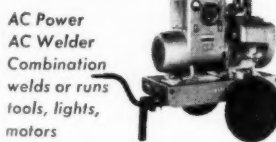
For more facts, use Reader-Reply Card opposite page 18 and circle No. 252

lightweight, portable  
air-cooled engine drive

## HOBART arc welder



250 amp.  
"Contractor's  
Special"  
water cooled  
welder



AC Power  
AC Welder  
Combination  
welds or runs  
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You'll save hundreds of dollars by having this husky arc welder on the job. Your own men can do the welding with this Hobart and the new simplified controls. It's easy to use and always ready on a moment's notice to go to work for you. Saves on replacement parts—keeps equipment working and avoids costly delays and down-time. There's a size and type to meet your particular requirements. Mail the coupon below for complete information, without obligation to you.

• Only in Hobart do you get the wide variety and choice of modern engine driven arc welders—backed by "Successful Manufacturers since 1893"

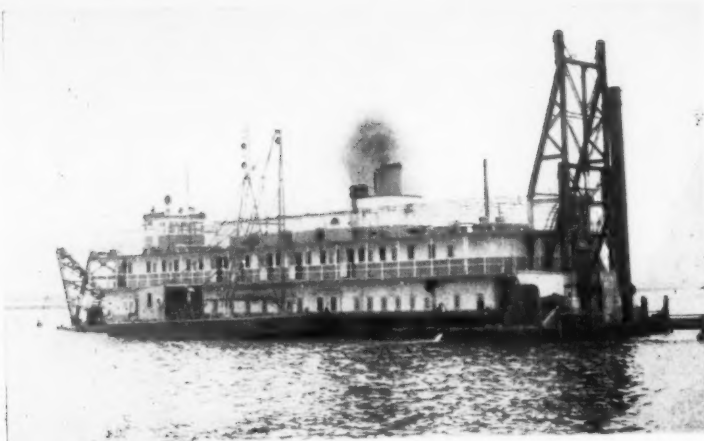
Use the coupon  
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• To HOBART BROS. CO., Box 896, Troy, Ohio  
Without obligation—send complete information on the equipment I've checked below

amp. Capacity ☐ "Husky Boy" air cooled arc welder ☐ 250 amp. Contractor's Special ☐ Arc Welder with 110 v. auxiliary power ☐ Standard water cooled gas drive

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FIRM \_\_\_\_\_  
ADDRESS \_\_\_\_\_

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 251



The biggest dredge on the work, the 24-inch John H. Shary, has living accommodations for a crew of 40 or more on its 52 x 175-foot hull. The anchor barge tied up beside the dredge does such work as changing spuds and handling anchors.

C&E Staff Photo

(Continued from preceding page)

to the swing lines were handled from an anchor barge with an A-frame and hoist operated by an International engine. A derrick barge with a 75-foot boom, and with a hoist powered by a Waukesha engine, also accompanied the dredges. This rig was used for changing spuds, handling anchors, and doing other heavy lifting operations.

Four big work boats were also on the job to move the anchor and derrick barges and serve the dredges in other ways. The largest was the Captain Tom, with a length of 44 feet, a beam of 13 feet, and a draft of 5 feet. It was powered by an International UD-24 engine. The Captain Ben, with a beam of 11 feet and a length of 30 feet, was powered by an International UD-16 engine. These two boats usually served the dredge C. S. E. Holland.

The two remaining boats accompanied the John H. Shary, which was skippered by Capt. F. O. Porche, and had Leon Brown as chief dredge operator and M. M. Flowers as chief engineer. The larger of these was the Captain Carl, a 38-foot boat powered by a Caterpillar 120-hp diesel engine, and Miss Greta, a 24-footer powered by a GM 6-71 engine. These boats barged fuel to the dredges, transported personnel, and performed miscellaneous duties.

#### The dredge C. S. E. Holland

The dredge Shary was assisted on the work by two slightly smaller machines, the 22-inch dredge J. J. Mansfield, and the 20-inch C. S. E. Holland. The Mansfield worked for about five months during the early stages of the work before leaving for another assignment. Its replacement was the C. S. E. Holland, which arrived on the site in February and worked until the job was completed.

Unusual on the Holland was the main dredge pump, which was mounted in the forward deck ahead of the superstructure. This arrangement had several advantages: in case of a serious leak in the pump case or the discharge line, water was more likely to go overboard and not have to be pumped from the hull. Also,

when heavy pump parts had to be handled during repair or replacement work, there was no limit to the headroom available.

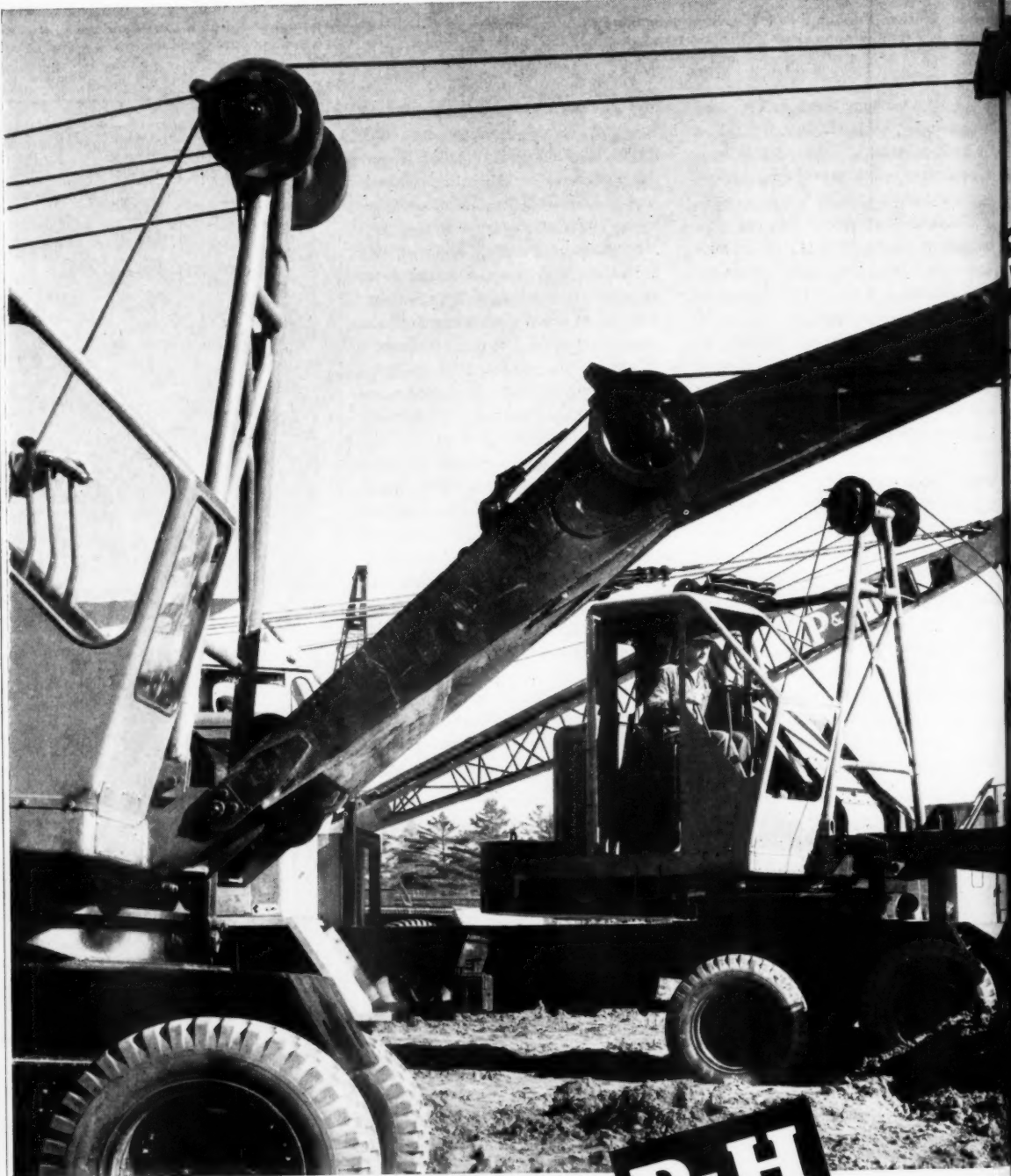
The 104 x 26-foot steel hull, with a draft of 7 feet, carried the usual mechanical equipment on the lower deck and had accommodations for the crew on the second deck and the lever room at the forward end of the third deck.

On a heavy A-frame at the bow, the 50-foot, 50-ton ladder carried a 24-inch suction line and a 5-foot 5-blade basket cutter. When caliche was encountered, this cutter was replaced with a smaller 6-blade cutter equipped

with cutting teeth. The cutter was turned by a 250-hp electric motor operating through a reduction gear box that stepped the speed down from 1,850 rpm.

The 22-inch dredge pump was fitted with a 24-inch suction line and 20-inch discharge line. It was powered by a 1,440-horsepower 16-cylinder GM diesel engine that operated through a Falk reduction gear box to step the speed down to 300-rpm.

Electrical power for such units as cutter and hoist was supplied by two GM 500-hp diesel generator sets, each rated at 290 kw and generating at 240 volts. One of these generators was



## Proving that

**P&H**

has

Today P&H is recognized as the leader in the excavator industry.

#### Why?

Because P&H, and P&H alone, has taken excavators out of the steam shovel era and applied automotive-type construction, automotive-type power trains and automotive-type controls to power cranes and shovels.

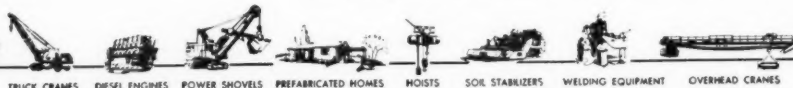
#### The result?

Power crane and shovel performance that delivers the highest net operating profit.

No matter what your shovel or crane needs are, be sure to get the full, profitable benefits of P&H unit roller construction, fabricated by arc welding. This feature alone eliminates troublesome assembly by multiple mechanical joints, bolts, rivets and tie rods!

Get the full P&H story—proof that P&H has the "guts" to do any job; proof that is borne out every day on the Harnischfeger Proving Grounds where every shovel and crane is thoroughly tested. Harnischfeger Corporation, Milwaukee 46, Wisconsin.

the **P&H** Line



TRUCK CRANES DIESEL ENGINES POWER SHOVELS PREFABRICATED HOMES HOISTS SOIL STABILIZERS WELDING EQUIPMENT OVERHEAD CRANES

The 20-inch dredge C. S. E. Holland of Bauer-Smith Dredging Co., measuring 104 x 26 feet and with a draft of 7 feet, works with a 5-foot 5-blade basket cutter and a 24-inch suction line to excavate the new channel.

C&E Staff Photo

capable of handling the normal work load while the other acted as an auxiliary and standby.

Controlled directly from the lever room through Westinghouse air controls, the ladder hoist and swing lines were operated by a 3-drum hoist powered by a 60-hp electric motor. The 2-drum hoist that handled the 24-inch square steel spuds was powered by a 50-hp electric motor. The spuds, 60.5 and 66.5 feet long, were built up of steel angles.

The 3,000-pound navy anchors were handled by separate anchor barges.

The 20-inch discharge line ranged from 1,000 to 2,000 feet in length with landings spaced 500 to 800 feet apart. From 800 to 900 feet of it was floating line supported on pontoons and equipped with Mobile Pulley & Machine Works ball-and-socket connections. The land line was fitted with a manually operated Y-valve, making it possible to extend the discharge line without shutting down the dredge.



Work stopped only when landings were changed.

The C. S. E. Holland, with Capt. S. W. Gillikin assisted by chief engineer Joe L. Lambert and dredge operator L. McDonald, racked up some good production figures for its operating records. During one complete month of operation, the dredge ran an average of 19 hours and 48 minutes per day and had an average daily production of 11,700 cubic yards. The next month, the operating time increased to an average of 20 hours and 42 minutes per day, but due to tougher digging conditions, production fell to a daily average of 9,935 cubic yards. The average monthly production of the Holland exceeded 300,000 cubic yards.

The John H. Shary produced an average of 400,000 cubic yards of material per month, the figure varying with the type of material encountered. The bid price for the excavation was 17 cents per cubic yard.

General supervision for the entire project for Bauer-Smith Dredging Co., Inc., was handled by W. S. Schilling, general superintendent. Area engineer for the Galveston District of the Corps of Engineers on this project was Homer L. Sisson of the Corpus Christi area office. District engineer of the Galveston district is Col. Willard P. McCrone.

THE END

#### Steel sheet piling

■ Lightweight steel sheet piling for protecting light-load excavations is described in a bulletin from the L. B. Foster Co. Action shots show the piling re-used for shore protection, sump pits, core walls, cofferdams, and abutments. Pictured and described are driving heads, sheathing drivers, and pulling tongs.

To obtain Bulletin E4525 write to the L. B. Foster Co., P. O. Box 1647, Pittsburgh 30, Pa., or use the Request Card that is bound in at page 18. Circle No. 37.

#### Gar Wood appoints new service manager

Gar Wood Industries, Inc., Wayne, Mich., manufacturer of highway construction machinery, has appointed Robert O Connell as service manager of the firm's Findlay Division, Findlay Ohio. He will direct service activities on the full line of Gar Wood and Gar Wood-Buckeye equipment.



## she GUTS to do the job!

The unretouched photograph above shows P&H equipment being tested at the Escanaba, Michigan, Harnischfeger Proving Grounds

*For Modern Engineering, Look to*

# HARNISCHFEGER

Power Crane & Shovel Division

For more facts, use Reader-Reply Card opposite page 18 and circle No. 253



The new TerraTrac backhoe features 180-degree swing with independent hydraulic foot-pedal control.

#### Introduce new backhoe for TerraTrac crawlers

■ A new backhoe designed and built exclusively for heavy-duty use on TerraTrac crawler tractors is announced by the American Tractor Corp.

The streamlined boom, featuring a minimum of gadgets and exposed hydraulic "plumbing", is fabricated of heavy steel plate, and is said to have a lifting capacity of 3,000 pounds for handling pipe and other materials. The new unit digs 12½ feet deep, has a reach of 18 feet, and a clear dumping height of 13 feet for loading

trucks. A bucket rollback of 90 degrees, controlled by an extra-large hydraulic pump, insures heaped loads without spilling. Buckets from 17 to 24 inches in width are currently available.

One of the features pointed out by the manufacturer is a full 180-degree boom swing with hydraulic foot-pedal control, which is said to speed up cycle time and greatly simplify operation by leaving the operator's hands free to maneuver the boom and bucket while swinging. An upholstered seat, which can be quickly reversed for operating the tractor or the backhoe, also increases the operator's comfort and efficiency.

Because it is designed specifically for use on TerraTrac crawler tractors, the new backhoe is said to offer much better balance and stability than other types of backhoes for working on rough ground and hillsides. Individually controlled hydraulic outriggers anchor the tractor firmly and prevent it from being dragged into the hole during digging operations. The outriggers also have the advantage of being close-coupled to the tractor to permit working within inches of buildings, fences, or other installations.

The new backhoe is currently being introduced on the TerraTrac Model 500 crawler tractor, equipped with Borg-Warner torque converter drive and a choice of either 50-hp gasoline or 45-hp Continental diesel engine.

For further information write to the American Tractor Corp., 800 Fort Wayne St., Churubusco, Ind., or use the Request Card at page 18. Circle No. 124.

#### Scrapers with elevators eliminate push-loading

■ A construction series of elevating scrapers has been added to the line of equipment manufactured by the Hancock Mfg. Co. The units are available for mounting directly to industrial tractors or, with front axle and wheels, for use as pull-type scrapers. All Hancock scrapers employ an elevator, powered either by the tractor's power takeoff or by an auxiliary engine or electric motor.

According to the company, the elevating scraper has eliminated the need of push-assistance for loading. All sizes can be loaded and operated by the driver alone, usually in less than a minute.

The depth of cut can be adjusted hydraulically from ½ to 6 inches. Spreading is also controlled hydraulically. Those scrapers using the front wheel or dollies have an adjustment which permits controlled weight distribution on the pulling tractor wheels for added traction.

For further information write to the Hancock Mfg. Co., P. O. Box 1359, Lubbock, Texas, or use the Request Card at page 18. Circle No. 25.

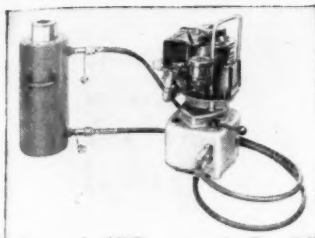
*faster*

## Royal Blue has won acceptance *faster* than any other wire rope in Roebling history



John A. Roebling's Sons Corporation, Trenton 2, N. J., Subsidiary of The Colorado Fuel and Iron Corporation. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5535 W. ROOSEVELT RD. • CINCINNATI, 2340 GLENDALE-MILFORD RD., EVENDALE • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • PITTSBURGH, 1723 HENRY W. OLIVER BLDG. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK 6.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 254



### Hydraulic power pump speeds jack operation

■ A lightweight, gasoline-powered hydraulic pump for use with all single and two-way Simplex Re-Mo-Trol hydraulic rams is available from Templeton, Kenly & Co. The power pump, with a displacement of 30 cubic inches of oil per minute, will raise a ram five times faster than would a hand pump with a displacement of 6 cubic inches of oil per minute.

The pump, known as the No. 798 GM, has a 1½-hp gasoline engine that provides a continuous operating pressure of 5,000 psi. It will furnish intermittent pressure of up to 10,000 psi.

When used with Re-Mo-Trol rams, the No. 798 GM provides combination units with capacities of from 10 to 600 tons for lifting and moving heavy loads. The set-up exerts lifting, pushing, or pulling force in any direction, while the operator remains a safe distance away.

The combination of the pump with a Simplex ram is recommended for lifting and lowering machinery, aligning beams, straightening buckets and forms, and prestressing concrete.

For further information write to Templeton, Kenly & Co., 2525 Gardner Road, Broadview, Ill., or use the Request Card at page 18. Circle No. 91.

### Pipe slide card

■ A slide card that gives specifications on various kinds and sizes of pipe and pipe fittings is available without charge from the Albert Pipe Supply Co., Inc. By setting nominal pipe size on the indicator, one can quickly read such data as wall thickness, weight per foot, bolt circle and flange diameters, and pressure at minimum yield. Information on welded flanges and fittings is also given.

To obtain the free slide card write to the Albert Pipe Supply Co., Inc., Berry and N. 13th St., Brooklyn 11, N. Y., or use the Request Card at page 18. Circle No. 132.

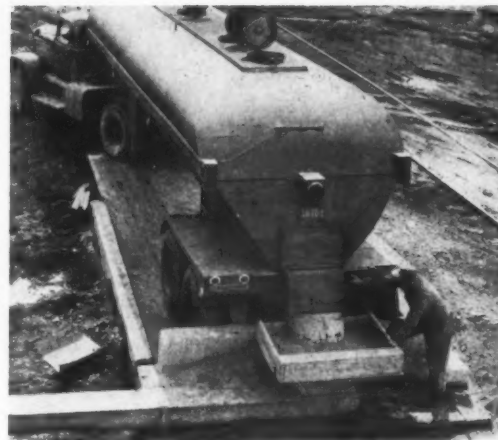
### Industrial tractors

■ The Deere & Co. line of industrial tractors and attachments is described in a catalog from the company. Models shown include the Model 420 track-type crawler and the 420 rubber-tire tractor. Also described are the No. 61 angling dozer for the 420 crawler, and the No. 47 mower for mounting on the rubber-tire 420. The 420 engine and the forced-feed lubricating system are pictured and described.

To obtain the catalog write to Deere & Co., 3300 River Drive, Moline, Ill., or use the Request Card at page 18. Circle No. 148.

For more facts, circle No. 255—

A MICHIGAN FIRM DELIVERS BULK CEMENT by means of a Fruehauf Airslide bulk cement tank-trailer at the rate of 120 barrels per trailer. The cement is loaded through the hatches atop the trailer. A 1-cylinder engine powers a blower which aerates the cement, causing it to flow through the discharge sock at the rear. The Airslide consists of U-shaped troughs topped with a specially woven fabric. When air is forced into the troughs, it seeps through the porous fabric to remove the angle of repose of the cement at the bottom of the load and makes the cement flow to the discharge point at the rear of the vehicle. For further information write to the Fruehauf Trailer Co., 10928 Harper Ave., Detroit 32, Mich., or use the Request Card at page 18. Circle No. 8.



STANDARD MC-3 Cut Back Asphalt is applied to Boulder County Highway 10. Standard Asphalt engineer Oscar Jones (left) and Highway Superintendent Douglas N. Stewart check application.

## Ordering STANDARD Asphalt

*makes job easier for Boulder County Highway Department*

Boulder County Highway 10 in Colorado links the city of Longmont with State Highway 66 three and a half miles to the west. It is a popular highway for travel to Rocky Mountain National Park and for farm-to-city traffic. Maintenance of this highway in first class, all-weather condition is made easy by the use of STANDARD Asphalt. The Boulder County highway department gets these benefits from ordering asphalt requirements from Standard: (1) top quality product and (2) an assured source of supply.

**And there are still more advantages** to ordering asphalt from Standard Oil. Standard's experienced asphalt salesmen know the needs of road builders and are qualified to work with them in planning requirements. Standard Oil has long experience as an asphalt supplier, knows what it means to protect customers on supplies and deliveries.

**You can get these advantages** when you buy asphalt from Standard. Find out. Call your nearby Standard Oil Office in any of the 15 Midwest and Rocky Mountain states, or contact Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.



As the link between Longmont and State Highway 66, Boulder County Highway 10 gets plenty of traffic. To take this traffic, road is surfaced with STANDARD Asphalt.



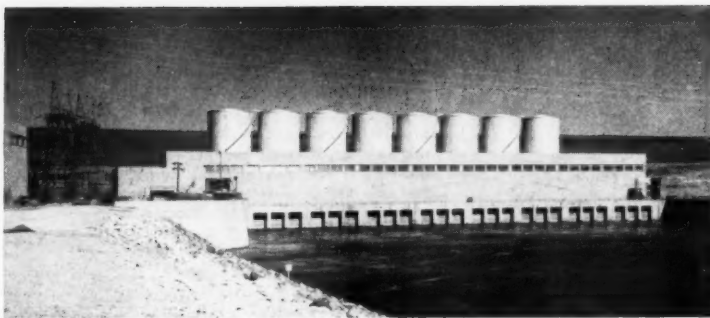
STANDARD OIL COMPANY (Indiana)

Highway 10 running west of Longmont, Colorado to State Highway 66 is 24 foot wide, asphalt surface, all weather highway. Standard Oil's Oscar Jones and Highway Superintendent Douglas N. Stewart inspect road recently resurfaced.





Fort Randall Dam, Pickstown, S. Dak., providing flood-control, hydroelectric power, and water-storage facilities, is a key feature of the Missouri River Development program.



The Fort Randall powerhouse has eight 40,000-kw generators for supplying hydroelectric power. Eight huge surge tanks are in the background, and to the left is the switchyard.

## Ceremony marks completion of Fort Randall Dam

A public celebration of the completion of Fort Randall Dam and Reservoir, a key control structure on the Missouri River at Pickstown, S. Dak., was held on August 11, at the North Point Recreation Area dam.

Built by the U. S. Army Corps of Engineers, the project provides flood-control, hydroelectric power, and water-storage facilities. The installation has eight 40,000-kw generators, sufficient to meet the hydro-electric power needs of a city of 600,000. The dam is 160 feet high and measures 10,000 feet long at the crest, while the reservoir has a capacity of 6,300,000 acre-feet.

The public ceremony was planned by a citizens' committee under the direction of Governor Joe Foss in cooperation with the Corps of Engineers.

## Solid film lubricant comes in aerosol bomb

Electrofilm, Inc., has announced a new air-dry solid-film lubricant. Lubri-Bond A is available in a handy aerosol bomb.

When sprayed on troublesome parts, both metallic and nonmetallic, this long-lasting, resin-base, solid-film lubricant is said to greatly increase the wear-life by decreasing the coefficient of friction of these parts. It op-



erates in a temperature range from minus 300 degrees F to plus 500 degrees F, and is reported to be an excellent lubricant for parts operating at high speeds and extremely high loads.

Lubri-Bond A dries in 30 minutes and can be used in conjunction with oils and greases where oil is necessary as a cooling agent, or it can be used without oils and greases when cooling is not a necessary function of the lubricant. According to the manufacturer, it is excellent for gears, actuators, cams, hinges, pins, shafts, tracks, threaded parts, frictional bearings, pistons, cylinders, valves, latches, and on all moving surfaces where friction is a problem.

For further information write to Electrofilm, Inc., P. O. Box 106, North Hollywood, Calif., or use the Request Card at page 18. Circle No. 100.

CONTRACTORS AND ENGINEERS

## The Times FULCO MATS CURE CONCRETE IN 3 DAYS

Big Help for Contractors!

Now you can cut concrete curing time a full week by the use of Fulco Mats. The old wet-burlap-wet-earth method, which took a full 10 days, can be discarded as unsatisfactory and uneconomical.

Fulco Mats use less water and stay wetter longer. They increase the compressive strength of concrete... insulate it against sudden temperature changes... produce a more uniform job.

Fulco Mats can be easily reused up to 75 times. This cuts cost-per-job to the lowest figure, makes Fulco® Mats pay for themselves.



FULTEX®

Triple-Strength Tarps  
Give extra protection to your men and materials

"World's  
Toughest  
Duck"



**Fulton**  
BAG & COTTON MILLS

For information, contact your equipment dealer or nearest Fulton branch

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SAVANNAH • WINTER HAVEN

For more facts, circle No. 256

## SAFE-T-FLARE Twin Flasher—All Metal Unit

### Modern Highway Warning Devices



Safe-T-Flare Twin Flasher Units used exclusively by KANSAS TURNPIKE AUTHORITY for lighting detours crossing turnpike.

### LOW COST RENTAL PLAN SAVES YOU MONEY ONLY 40¢ PER DAY

Low rental price includes delivery to job, maintenance, replacement of all parts, theft or damage beyond repair—everything necessary to do a superior flaring job!

SUCCESSFULLY USED BY CONTRACTORS THROUGHOUT THE NATION

A NATIONWIDE SERVICE

Ask about our 6-volt portable auxiliary Traffic Control Light Units for day or night use.

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**SAFE-T-FLARE CORP.** 2005 Armour Road  
North Kansas City, Missouri  
Phone Victor 2-1329

For more facts, circle No. 257

## HOW TO RENEW RUSTED, BUSTED, WORN THREADS ON THE SPOT IN MINUTES

### SAVE DOWN TIME

Ruined threads, broken or frozen studs are no longer a problem. Just drill out, tap with special Heli-Coil® tap, wind in Heli-Coil Insert. Result? Original-size thread of stainless steel, strip-proof and corrosion-proof.

Recommended by leading manufacturers of trucks, road and agricultural equipment, autos, utility engines. Everything needed comes packed in a convenient, inexpensive Heli-Coil Ezy-Kit or Heli-Coil Shop-pack for each thread size. Wide range available in NC and NF series; also pipe and spark plug threads. Sold by leading automotive wholesalers.



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IN CANADA: W. R. Watkins Co., Ltd., 41 Kipling Ave. S., Toronto 18, Ont.  
For more facts, use coupon or circle No. 258



The Shawnee D90 Chief backhoe, here mounted on a Case diesel tractor, features two synchronized cylinders for "push-pull power."

### New backhoe will dig to depth of 14 feet

■ A backhoe that will dig effectively to 14 feet below ground level has been announced by Shawnee Mfg. Co., Inc. In addition to its digging depth, the Model D90 Chief backhoe offers "push-pull power" through the synchronization of the action of a push cylinder at one end of the bucket boom axis with a pull cylinder located midway between the axis and the bucket.

Without moving from his tractor seat, the Chief's operator can switch the boom to any one of three 120-degree working quadrants. Hydraulically controlled stabilizers align the tractor for plumb digging.

Heavy plate steel is welded to form the box frame of the main boom. The main frame is constructed of 1/2-inch plate. Every moving part on the Chief is equipped with replaceable bronze bushings. The rig can be removed from the tractor quickly by pulling 4 pins, the manufacturer points out.

For further information write to Shawnee Mfg. Co., Inc., 1947 N. Topeka Ave., Topeka, Kans., or use the Request Card at page 18. Circle No. 93.

### Steel, alloy welding

■ The application, physical properties, and procedure of welding mild steel and low-alloy high-tensile steel are incorporated in a Welding directory bulletin from the Lincoln Electric Co. Data is given on the type electrode to use for the welding—Fleetweld, Jetweld, or Shield-Arc. Also included is information on the type of current needed.

To obtain the bulletin write to The Lincoln Electric Co., P. O. Box 5758, Cleveland 17, Ohio, or use the Request Card at page 18. Circle No. 141.

### Portable electric mixer

■ Action shots of a portable electric tub mixer for plaster and mortar are included in a mailing piece from Master Vibrator Co. Called the Handy Mixer, the unit is shown being operated by one man right next to the job, either inside or outside. The specifications table states that the mixer operates on a 1-hp, 115-volt ac motor.

To obtain Form No. MV-1215 write to Master Vibrator Co., 1752 Stanley Ave., Dayton 1, Ohio, or use the Request Card at page 18. Circle No. 55.

For more facts, circle No. 259→

### Telescopic cylinders for line of hoists

■ A new telescopic hoist cylinder for use in Galion's Uni-scope and Duo-scope hoists has been announced.

The cylinders feature seamless alloy-steel sleeves, with ground and polished surfaces, reported to provide leak-free operation and long seal life. Extra-long bronze guides at the top and bottom of each sleeve are said to assure rigidity of the cylinder throughout its entire stroke length.

Available with lifting capacities of from 10 to 34 tons, the telescopic cylinders are offered in cylinder diameters of from 5 to 8 inches, with three

to six stages and 60 to 128-inch stroke lengths.

For further information write to the Galion Allsteel Body Co., Galion, Ohio, or use the Request Card at page 18. Circle No. 19.

### Schramm expands factory

Schramm, Inc., West Chester, Pa., is building a 600×60-foot one story building to increase its factory floor space from 145,000 to 181,000 square feet. The addition has been made necessary by the increased output of Schramm, which manufactures portable and stationary air compressors, Pneumatractors, Rotadrills, etc.

## RICHMOND REFERENCE GUIDE FOR YOUR CONCRETE CONSTRUCTION NEEDS

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<p>3000 lb 5000 lb SNAP-TYS Light Wall Forms</p> <p>1 4</p>	<p>1/2" to 1 1/2"</p> <p>2 STRUT TYSCRUS Heavy Wall Forms</p> <p>1 2 3 4</p>	<p>1" to 1 1/2"</p> <p>4 STRUT TYSCRUS Mass Concrete Forms</p> <p>2 3</p>
<p>1/2" to 1 1/2"</p> <p>CONTINUOUS THREAD LAGSTUD Adjustable Connectors</p> <p>1 2 3 4</p>	<p>1/2" to 1 1/2"</p> <p>TYLOOPS Form Anchorage</p> <p>3</p>	<p>3/8" to 1 1/2"</p> <p>SCREW ANCHORS AND BOLTS Anchorage to Concrete</p> <p>2 3</p>
<p>1 1/4" - 1 1/2"</p> <p>WHIRL-WIND ANCHORS (No Slip) Lift Form Anchorage</p> <p>3</p>	<p>1/4" to 3/4"</p> <p>THREADED INSERTS Fastening to Concrete</p> <p>1 2 3 4</p>	<p>3/4" - 3/4"</p> <p>PEERLESS WEDGE INSERT Shelf Angle Support</p> <p>1</p>
<p>SNAP-TY HANGER Hanging Light Forms</p> <p>1 4</p>	<p>1/2" to 1</p> <p>TYHANGER Hanging Heavy Forms</p> <p>1 2 4</p>	<p>HANGER FRAME SCREED Form Hanging and Screeding</p> <p>2</p>
<p>ADJUSTABLE SCREED CHAIR Screeding Slabs</p> <p>1 2 4</p>	<p>REINFORCING BAR SUPPORTS Steel Support</p> <p>1 2 3 4</p>	<p>3/8" - 1/2"</p> <p>TILT-LOCK ASSEMBLIES Fast Acting She-Bolts</p> <p>2 3 4</p>
<p>TYFRAME Stadium Forms</p> <p>1</p>	<p>DOWEL SUPPORTS Road Joint</p> <p>2</p>	<p>LOAD TRANSFER ASSEMBLIES Airport Slabs</p> <p>2</p>

The above is a partial showing of the 358 items contained in the Richmond line of engineered concrete form-lying devices, anchorages and accessories—the largest line in the field. All items are designed for specific uses, not only for the fields pictured above but also for the building of stadiums, grand stands, auditoriums, retaining walls, curtain walls, silos, etc. Whatever your concrete construction needs, contact Richmond. Richmond products are engineered to give you extra strength, ease of handling, utmost economy. Write for complete catalogue. If you have a specific problem, Richmond's Technical Division or field service men will be glad to submit drawings, engineering data and proposals. Address: RICHMOND SCREW ANCHOR CO., INC. — 816 Liberty Ave., Brooklyn 8, N. Y. and 315 South Fourth St., Saint Joseph, Mo.

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RICHMOND REFERENCE GUIDE  
FOR YOUR CONCRETE  
CONSTRUCTION NEEDS

buildings 1

roads & bridges 2

tunnels & dams 3

water & sewage  
PLANTS 4

# Wellpoints

keep riverbed dry  
as scrapers dig  
siphon trench

When D. D. Skousen & Son entered a low bid of \$440,000 for construction of the 1,340-foot Artisco Siphon 40 feet under the riverbed of the Rio Grande—beating all competitive bids and the engineers' estimate—bidders were sure that the price would put the Albuquerque firm back into the road-contracting business. Skousen completed the job more than a month ahead of schedule, however, digging the siphon trench with scrapers and pouring the 78-inch ID reinforced-concrete siphon in place rather than constructing it of prefabricated pipe joints.

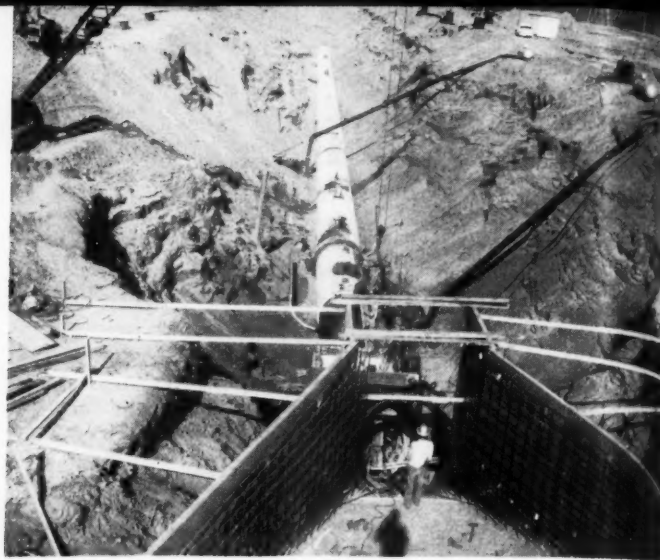
The 15-inch-thick pipe sections, 24½ feet long except where the grade slopes, are without footings or a cushion course. Resting on native stream bed material, they are covered with about 35 feet of sand backfill from the alluvium stream bed.

This U. S. Bureau of Reclamation siphon will conduct water under the river from the east to the west bank, delivering it to Arenal canal which feeds irrigation canals running southward to water the thirsty acres in the Middle Rio Grande project near Pajarito and Los Padillas, N. Mex. The project, and the system of irrigation and drainage canals behind the levees at the river banks, will prevent much of the irrigation water from being lost by seepage—as was the case when the water was carried in the Rio Grande riverbed. One section of such a combination drainage and irrigation supply ditch on the east bank, recently enlarged, will deliver water to the Artisco Siphon's headworks structure.

Skousen started the job on December 6, 1955, when the river was at its lowest ebb, hoping to get most of the work finished before the flood season started in late April or early May. An orderly work sequence, established at the start, made it possible for crews to move swiftly on the job.

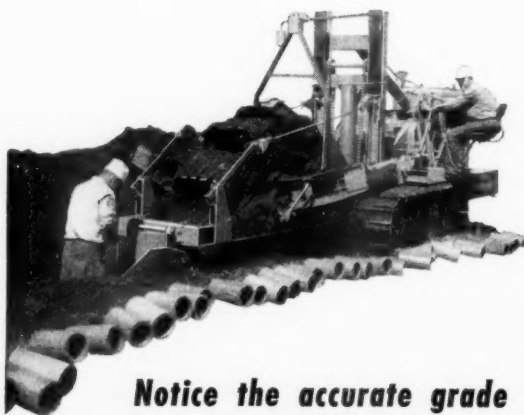
Since site conditions favored construction of the east half of the siphon first, Skousen dug several small drainage ditches to carry away water pumped from underground. These ditches also carried the normal flow of the Rio Grande, which was diverted through the channels by an earth plug, while the west half of the siphon was being built.

The unwatering problem was turned over to experts from John W. Stang Corp., Bell, Calif., who outlined a method of unwatering for Skousen. The unwatering system consisted of



The reinforced-concrete line begins to take shape at the siphon outlet. The wells and Stang pumps with individual discharge lines, located on the downstream side of the excavation, dropped the water level 60 to 65 feet.  
U. S. Bureau of Reclamation Photo

Digs up to 25 FEET per minute



Notice the accurate grade  
you get with this Parsons  
150 wheel-type Trenchliner

For pipeline, drainage, irrigation and utility trenching, Parsons 150 Trenchliner brings you big work capacity and precision grading accuracy. It digs from 12 inches to 25 lineal feet of trench per minute. 30 digging feeds assure maximum trench production at every depth, width, and in all soil conditions. Cutting widths range from 16 to 26 inches. Maximum digging depth is 5¾ feet.

Hydraulic wheel-hoist gives smooth, positive control of trench depth. A hydraulic ram on vertical mast raises and lowers the digging wheel — maintains close grade tolerance, an important advantage on any trenching job. A separate hydraulic ram tilts the mast — balances weight of wheel forward on the machine when traveling, loading or unloading on trailer.

For digging dry or wet materials, quick-change buckets on the Parsons 150 Trenchliner are available with gumbos, lips, or self-sharpening reversible "Tap-In" teeth. Shiftable, reversible belt conveyor gives controlled discharge, places spoil bank on either side of trench. Tile-laying box and chute (optional) save time and labor on drainage jobs. To suit varying job conditions, this 150 Trenchliner is also available with 16-inch, lug-type crawlers, or 12-inch crawlers with street shoes. Your Parsons distributor has more information that will interest you. See him soon, or write for bulletin.

... Send to: **PARSONS CO., Newton, Iowa** ...  
for bulletin on 150 wheel-type Trenchliner

NAME \_\_\_\_\_  
COMPANY \_\_\_\_\_  
STREET \_\_\_\_\_  
CITY, STATE \_\_\_\_\_



(Koehring  
Subsidiary)

**PARSONS TRENCHLINERS®**

CONTRACTORS AND ENGINEERS

## Sections of 78-inch ID reinforced-concrete line are poured in place by crane-and-bucket method

a series of 12-inch wells, encased in gravel backing and centered in a 36-inch-diameter well hole. The wells, placed on the downstream side of the ditch, were spaced 90 feet apart and went about 90 feet deep. All but the bottom 12 feet, which had perforated screens to pick up water, were steel cased.

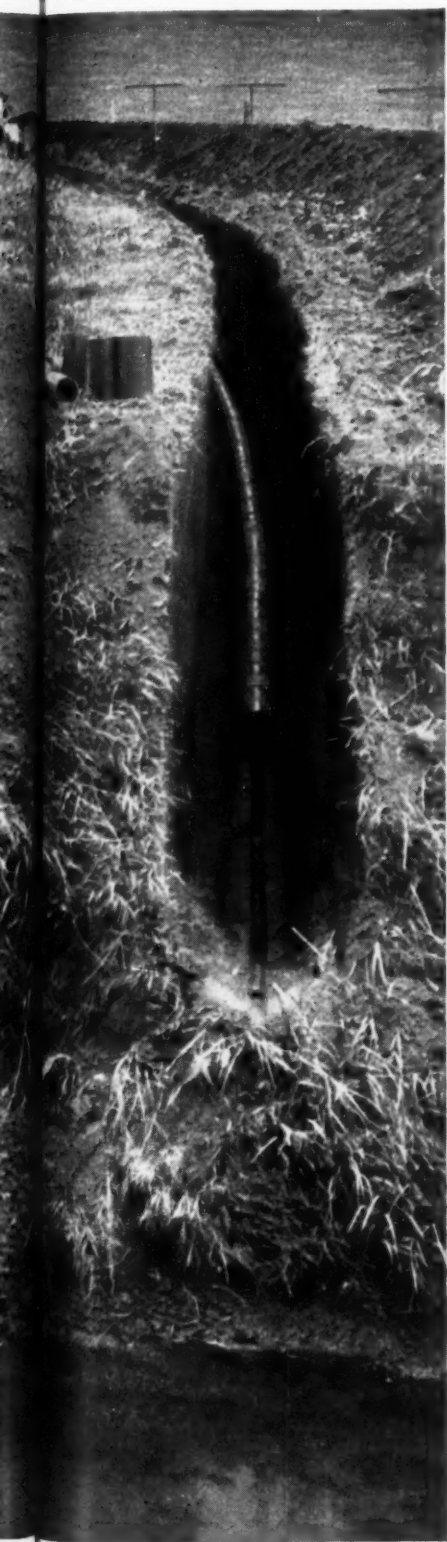
### Drilling in sand

Since drilling in sand is tricky work, this job was subcontracted to Luhr Bros., Inc., Columbia, Ill. Using a

rotary bucket-type earth-boring drill well suited for work in sand, the firm put down the 36-inch diameter holes, keeping them filled with water to hold caving to a minimum. The bucket was sunk into the hole gently so that no surge or suction was created, then "screwed in" tightly to pack the material and keep it from being lost as it was withdrawn. The subcontractor did the entire well-installation job at once, then covered the wells on the west side until they were needed. The firm even drilled wells in the Rio



The Blaw-Knox steel forms for the line are set in place over steel reinforcing cages by a crane. This area, not completely unwatered by the well system, is kept dry by wellpoints.



### Bearings packed only once a year on this 4-PM mixer

For more work-time, less maintenance, check this Kwik-Mix 4-PM plaster-mortar mixer. There is no daily lubrication required on the antifriction paddle-shaft bearings. They are packed in grease, multiple sealed. You'll also like the simple de-clutching arrangement on V-belt drive, 4 self-cleaning blades, optional rubber tips. Has 38-inch charging height, 29-inch width, all-welded frame. Kwik-Mix 6-P and 10-P sizes also available.

KWIK-MIX • Port Washington, Wis.  
(Koehring Subsidiary)



### Portable batch plant or cement transfer plant

Johnson Elevating Charger unloads cement from box cars or hopper-bottom cars, and loads into trucks. Charger has a 1000-lb. cement weigh batcher, hung under a 33-bbl. overhead storage hopper. Or, to charge dual-batch trucks, two 1000-lb. batchers can be used. It's easily changed to cement transfer plant by removing batchers, cone, and bolting a 50-bbl. extension section to the upper hopper. See your Johnson distributor.

C. S. JOHNSON • Champaign, Ill.  
(Koehring Subsidiary)



### Koehring 1/2-yd. hoe digs 17 3/4-feet deep

With long reach, Koehring 1/2-yard 205 hoe puts dirt far beyond edge of cut, or gives 8 3/4-foot clearance height to load trucks. Close-coupled dipper pulls up tight to the goose-neck boom, avoids spillage. Powerful cable crowd, fast line and swing speeds maintain big-yardage output. This heavy-duty 205 converts to 1/2-yard shovel, 1/2 to 3/4-yard dragline or clamshell, 10-ton crane. On truck mounting the 205 has 15-ton lift capacity.

KOEHRING Company  
Milwaukee 16, Wis. V61REV.



Grande River channel, using the drilling machine on a sand ramp that had been built up by a dozer.

Each well in an active section was equipped with a Stang 10-inch pump with individual discharge lines. Seven of these pumps operated on the east half of the job, bringing the water table from the riverbed surface to a point 60 to 65 feet down in the wells. Studies made by USBR engineers showed the drawdown curve to be relatively flat. About 200 feet upstream from the wells, the water level stood 30 feet from the surface in test holes. The curve on the downstream side was presumed to be about the same.

Though pumping and excavation started at about the same time, there was only a 30-foot section where tractor equipment was not always in the dry. The tractors and scrapers excavating the ditch were Cat D8's and D7's with 15-yard scrapers, together with Allis-Chalmers HD20's and International TD24's for push loading.

These rigs started the ditch cut 120 feet wide at the top, and carried slopes down at 1 to 1 to give the bottom a 20-foot width. The damp sand packed into the scrapers well and good loads were hauled each trip. Scrapers hauled in a circular pattern so that those returning to the ditch did not slow down rigs coming from the excavation.

Dropping down into the east end of the ditch, the scrapers picked up their loads, left by a ramp at the opposite end, and dumped their loads in a pile that was built up parallel to the upstream side of the ditch, opposite the unwatering pumps.

A Caterpillar tractor and Traxcavator loader fine-graded the last few inches of the ditch, and a small labor crew finished the ditch off to grade.

With the work area dry and accessible to crews and equipment, the job of casting the siphon barrel was almost routine. Two sets of Blaw-Knox steel forms, consisting of 3-piece internal and external sections, were mounted on rail sections, and were set, lined, and held in position by jacks.

Skousen produced his own concrete in a Binabatch plant at the site, using graded aggregate from a local firm. Batches were dumped to the

5 OTHER SIZES Parsons Trenchliners include wheel and ladder types, crawler-mounted, and utility-size rubber-tired Transmobiles.

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 260



At this point, the Stang 10-inch pumps at the 90-foot-deep wells have lowered the water table about 40 feet. The 12-inch wells, centered in a 36-inch-diameter well hole, are spaced 90 feet apart on the downstream side of the trench.

U. S. Bureau of Reclamation Photo

compartments of batch trucks that hauled the short distance between the plant and the 16-S mixer.

The concrete was placed by the crane and bucket method, a Gar-Bro transfer bucket being used. Internal electric vibration, done through trap doors, and external vibration were handled with Viber machines.

By using an extra 70 pounds of cement in every cubic yard of mix, making a 6¼-sack mix, Skousen developed the required 4,000-psi compressive strength in the line in 12 instead of 28 days so that the line could be tested.

The first half of the siphon was tested after one end had been bulkheaded and the line loaded with water from the bulkhead to the intake structure. This delivered about 40 feet of head and showed that the section was able to carry its load of 250 cfs without leaking.

After backfill had been placed so that the line was loaded evenly with uncompacted material, the well pumps, casings, and screens were pulled and moved over to the west half of the project. Dozers then shoved the remainder of the material in the spoil pile over the pipe until backfilling was completed.

The process used to construct the east half of the line was repeated on the west half, completing concrete work on the entire line long before the flood period in the Rio Grande.

#### Personnel

Credit for this construction job goes to Skousen's management—D. D. Skousen, his son, D. D. Skousen, Jr.,—and to G. F. Chapel, who was general supervisor of the project for the firm. The siphon was built by the Albuquerque office of the U. S. Bureau of Reclamation, and field supervision was exercised by John Thompson, project manager.

THE END

#### ASCE forms new division

The American Society of Civil Engineers has established a new division to satisfy the increasing need for specialized technical and professional study, development, and practice in the pipeline field. To be known as the Pipeline Division, the new unit is an outgrowth of the committee on pipelines of the Construction Division.

#### Announce two new blades in break-resistant line

■ Two new blades have been added to the Polk-A-Dot Series of triple-reinforced, break-resistant abrasive blades made by the Clipper Mfg. Co.

The CBR-914 is recommended for saw cutting on extremely hard materials such as hard glazed tile and brick, as well as other products of comparable density. The CBR-922 offers low-cost cutting on lightweight-type materials such as cinder block, pumice block, and certain refractories, including insulating brick.

The two new blades feature extra reinforcing on both sides at the hub, where the strain is greatest.

For further information write to the Clipper Mfg. Co., 2800 Warwick,

Suite 635, Kansas City, Mo., or use the Request Card at page 18. Circle No. 17.

#### Paint pumps

■ Portable and stationary paint pumps for equipment-maintenance shops and for use in coating structural steel are covered in a bulletin from The DeVilbiss Co. Diagrams show one and two-spray station hook-ups, and a circulating system with original paint drums, mixing tanks, and stand pipe. Specifications, accessories, and job photos are also shown.

To obtain the bulletin write to The DeVilbiss Co., 300 Phillips Ave., Toledo 1, Ohio, or use the Request Card at page 18. Circle No. 140.

## 3 PAYLOADER® models ...

Now you have a choice of three sizes of 4-wheel-drive "PAYLOADER" tractor-shovels, each with *all* the more-productive features pioneered and proven by The Frank G. Hough Co.

They have power-transfer differentials—an exclusive "PAYLOADER" tractor-shovel feature that maintains effective traction on mud, gravel, ice and snow.

They have "no-stop" power-shift trans-

missions and torque converters . . . planetary final drives . . . power-steering and 4-wheel power brakes.

They have the exclusive bucket motion with 40° bucket tip-back at ground level and powerful pry-out action.

For proof of their superior performance and greater productive capacity, ask your "PAYLOADER" distributor for a demonstration.

1

**Dig More**

Powerful pry-out action and 40° bucket tip-back at ground level get full bucket loads with less spillage loss. Power-transfer differentials provide sure-footed traction for digging power.

2

**Carry More**

Bucket carry position is close and low for maximum stability. Hydraulic system shock absorber cushions loaded bucket—smooths the ride—permits higher carrying speeds with less spillage.

3

**Deliver More**

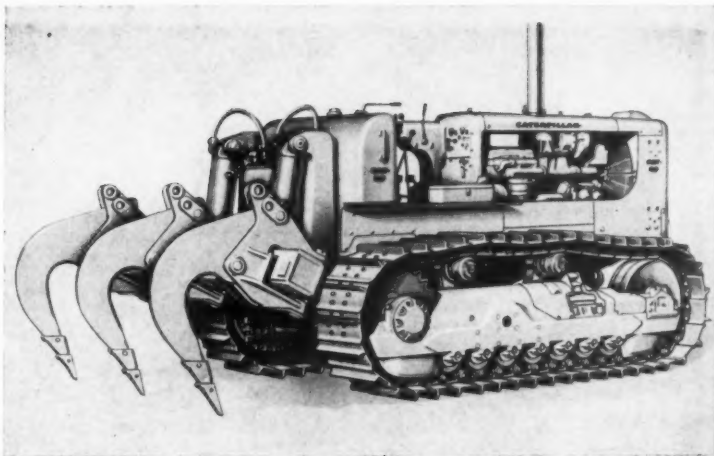
Since you get MORE to begin with and keep MORE while traveling at higher speeds . . . with less spillage in both instances . . . the result—you deliver more yards per load and more loads per hour.

## New heavy-duty ripper for use with D9 tractor

■ A new tractor-mounted ripper designed specifically for use with the D9 tractor has been announced by Caterpillar. Increased maneuverability, better control of ripping depth, and extreme utility are said to be important features of the new attachment.

The complete ripper consists of two mounting brackets, two hydraulic cylinders, one beam assembly, and three teeth. It weighs 10,830 pounds.

The No. 9 ripper mounts on the bevel gear case through a special drawbar bracket group which replaces the standard drawbar brackets. The ripper is operated hydraulically by two cylinders working in conjunction with the Caterpillar No. 50 hydraulic



The No. 9 ripper recently introduced by Caterpillar Tractor Co. is designed for use with the D9 tractor.

control. Convenient hydraulic controls give the operator good control of the ripping depth, which ranges to 28 inches.

The box-section beams, 12 inches x 12½ inches x 10 feet 7¾ inches, are made of alloy-steel plates, submerged-arc-welded for high-quality welds and reinforced inside by additional plates.

This new tractor-mounted ripper can perform a variety of jobs, according to the manufacturer, and extends the utility, range, and efficiency of either a bulldozer or scraper. The attachment is used primarily to break up hard materials for subsequent scraper loading. When mounted on a D9 for push-loading, it enhances the utility of the tractor; besides push-loading, the D9 can rip between cycles for easier scraper loading.

For further information write to the Caterpillar Tractor Co., Peoria, Ill., or use the Request Card at page 18. Circle No. 71.

## Single-type rim valve for tubeless tire setup

■ A new single-type rim valve has been introduced by the Metal Products Division of The Goodyear Tire & Rubber Co. According to the company, the new valve replaces 16 different valves previously required to do the job.

Adaptable to any Goodyear tubeless highway rim, the 2-inch-long unit is said to reduce cost, downtime, and inventory for units ranging from the smallest truck to the biggest earth-moving vehicle. The valve can be threaded into the rim wall of a disk wheel or adapted to any size of Drop Center tubeless truck and Tru-Seal over-the-road rims merely by varying the location of the valve hole.

Reportedly easy to handle, the new valve has a minimum of parts, which assures maximum speed in assembly.

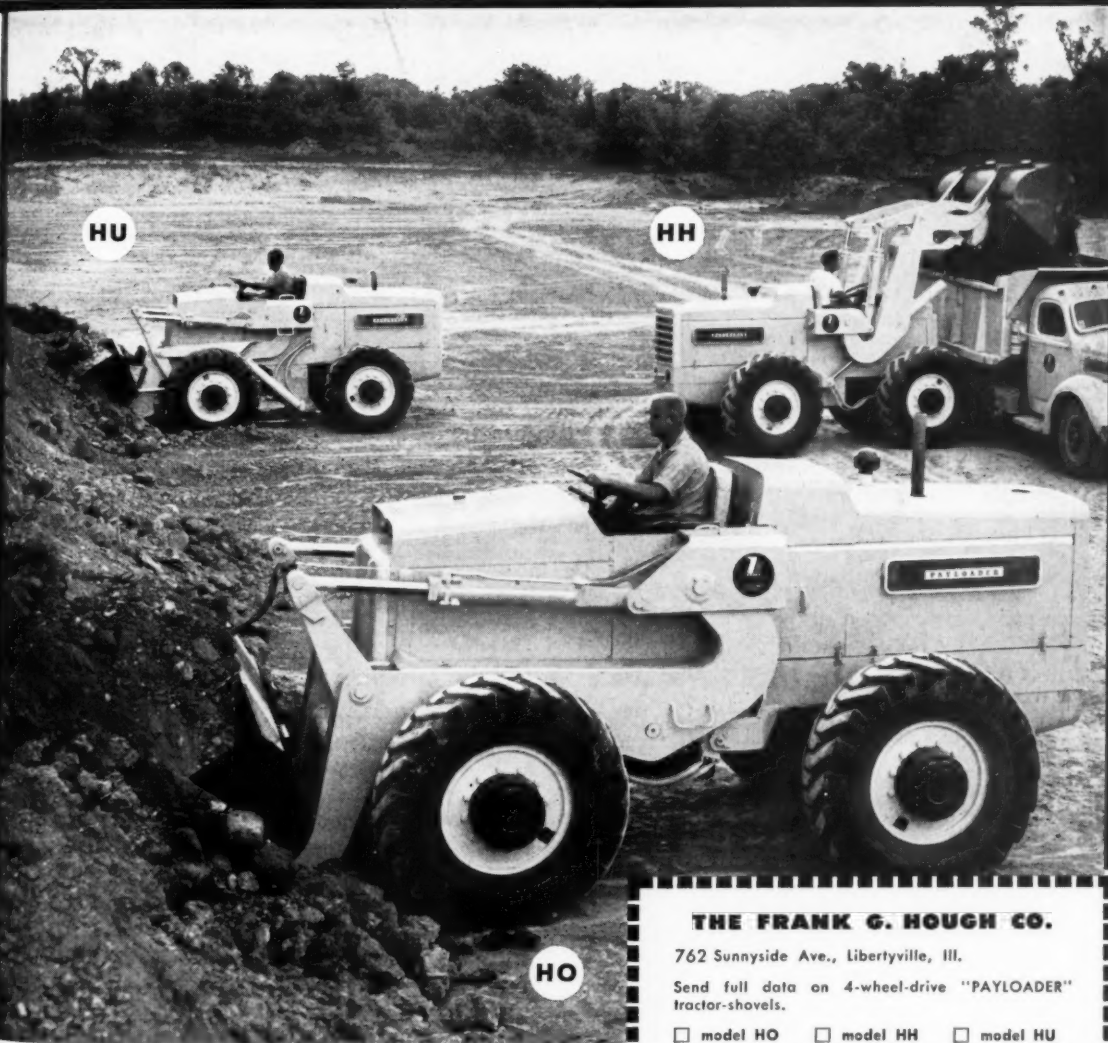
For further information write to Goodyear Tire & Rubber Co., Akron 16, Ohio, or use the Request Card that is bound in at page 18 of this issue. Circle No. 96.

## Soil-testing apparatus

■ Apparatus for engineering tests of soils, concrete, asphalt, and other materials are pictured and described in a 1956 catalog from Soiltest, Inc. Equipment listed ranges from pocket penetrometers for soils, to pavement deflectors for asphalt, to 200,000-pound compression testing machines for concrete. One section of the catalog is devoted to soil mechanics apparatus, and basic sampling and preparation equipment plus testing machines for triaxial, confined compression, direct shear, and consolidation tests. Data on compression and flexure, slump, mixing, molding, volumetric measurements, and curing and cement testing are incorporated in the concrete section. Test apparatus for asphalt and bituminous materials conclude the 128-page catalog.

To obtain the 1956 catalog write to Soiltest, Inc., 4711 W. North Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 64.

# 3 WAYS BETTER!



The "PAYLOADER" line is the most complete, most proven tractor-shovel line—sizes from 14 cu. ft. to 2¼ cu. yd. . . . choices of front-wheel-, rear-wheel- and all-wheel-drive.



**PAYLOADER**  
MANUFACTURED BY  
**THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.**  
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY



### THE FRANK G. HOUGH CO.

762 Sunnyside Ave., Libertyville, Ill.

Send full data on 4-wheel-drive "PAYLOADER" tractor-shovels.

☐ model HO ☐ model HH ☐ model HU  
2¼ yd. heaped 1¾ yd. heaped 1½ yd. heaped  
1¾ yd. struck 1½ yd. struck 1 yd. struck

NAME \_\_\_\_\_

TITLE \_\_\_\_\_

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STREET \_\_\_\_\_

CITY \_\_\_\_\_

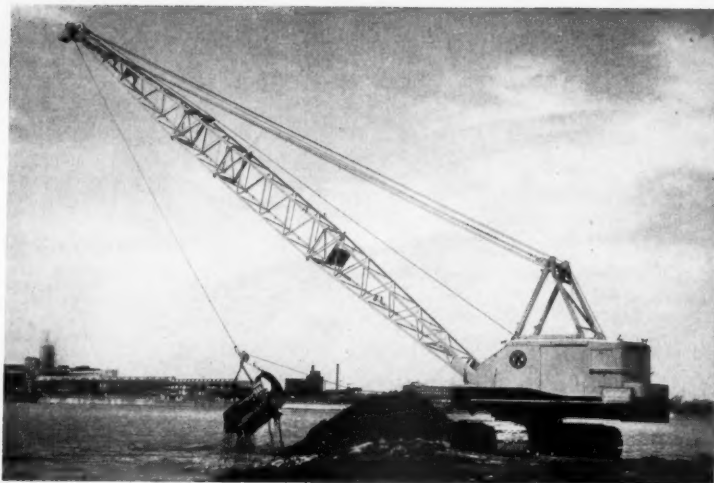
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For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 261

## New excavator handles 3 to 4-yard buckets

■ The newest and largest member of the Koehring line of shovels and cranes, the Model 1205 excavator-crane, has a lifting capacity of 95 tons at 75 per cent rating. As a shovel, it takes a 30-foot boom with 22-foot-dipper sticks and a 3-cubic-yard bucket. A 60-foot alloy-steel boom that extends to 180 feet, with an additional 30 feet of jib boom, converts the rig to lift crane and dragline or clamshell operations.

According to the manufacturer, the Model 1205 is easily converted from shovel to crane operation. As a crane, it handles buckets of from 3 to 4-cubic-yard capacities, depending on digging conditions.



For dragline or lift operations, the Model 1205 uses a 60-foot boom that can extend to 180 feet.

The Model 1205 has an all-welded turntable and carbody that includes mechanical swing and main clutches said to be unaffected by heat even under extreme working conditions. The power-actuated clutches on the main drums are controlled manually by levers. Spring-loaded traction brakes are released by air to help reduce operator fatigue.

Other features include anti-friction bearings on swing and traction clutches and on all constantly rotating shafts; involute splines on all shafts; a self-cleaning crawler system; and removable, grooved drum lagging.

For further information write to the Koehring Co., 3026 W. Concordia Ave., Milwaukee 16, Wis., or use the Request Card at page 18. Circle No. 92.



The Universal 293QS on a road construction site west of Tremonton, Utah, 1955.

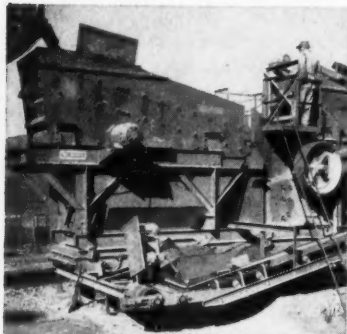
## The Universal 293QS TwinDual Gravel King has

"Increased our pay load by 33 1/3%, lowered operating costs 10c per ton"

Says Jed R. Abbott of Germer, Abbott & Waldron Construction Company, Tremonton, Utah

Abbott's company saved \$20,000 on its first large order for aggregate produced by the Universal 293QS.

"After turning out 200,000 tons of



### More than a gravel producer

The 293QS is the most versatile machine on the market—two plants in one! Inquire how you can convert it quickly from gravel to crushed stone production and back again.

material for U.S. Highway 91 last year," said Abbott, "this is the most economical plant we've ever operated. Our payload is a third more and our costs were ten cents a ton less than with other crushing equipment."

"On the Highway 91 job, it took three D-8 Cat dozers and a scraper to feed the 293QS. The plant we were using before required only one D-8. That'll give you an idea of the difference in capacity."

You'll have a story to be proud of, too, when you work with the Universal 293QS. Producers are enthusiastic about the ability of this plant to make up for lost time. As Jed Abbott puts it, "The severity of Utah weather could mean the loss of much production, but with the Universal 293QS we have the capacity to fill larger orders, fill them faster, charge less and make more money in the long run."

Nearly everyone, like Germer, Abbott and Waldron, goes through seasonal or other costly shut-downs. Costly, that is, unless like Germer, Abbott & Waldron,



### Volume production through improved design

Finished material on final belt. Exclusive Universal TwinDual roll crusher permits up to 100% wider discharge opening of the extra-large primary jaw crusher. Jaw efficiency increased by pre-screening pit-run material before entering crusher.

you've discovered crushing equipment like the Universal 293QS — designed to recapture time lost — at a profit!

Write for complete facts on the Universal 293QS Gravel King now.

## UNIVERSAL ENGINEERING CORPORATION

620 C Avenue, N.W., Cedar Rapids, Iowa

Subsidiary of Pettibone Mulliken Corporation, 4700 W. Division Street, Chicago 51, Illinois

For more facts, use Reader-Reply Card opposite page 18 and circle No. 262

## Truck transmission hints

■ The operation, lubrication, maintenance, and inspection of heavy-duty truck transmissions is the subject of a booklet from the Fuller Mfg. Co. Helpful tips are given on all four points. The function of a transmission and the responsibilities of the truck manufacturer with regard to transmissions are enumerated. Pictures and diagrams illustrate the topics.

To obtain Form No. 102 write to the Fuller Mfg. Co., Prouty St., Kalamazoo, Mich., or use the Request Card at page 18. Circle No. 146.

## Michael Baker purchases old engineering firm

One of the oldest engineering firms in the United States, the 135-year-old J. Murray Africa Co., Huntingdon, Pa., has been purchased by the consulting engineering firm of Michael Baker, Jr., Inc., Rochester, N. Y. Present personnel at the Africa office will form the nucleus of the new division.

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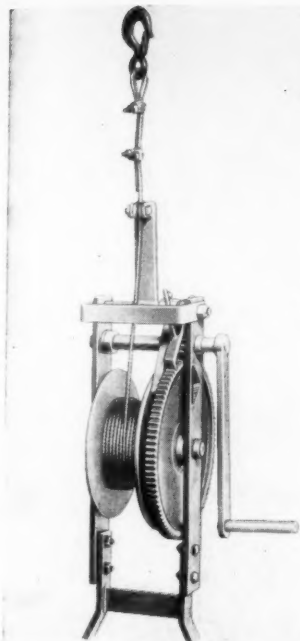
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For more facts, circle No. 263

CONTRACTORS AND ENGINEERS





The Bil-Jax safety winch is available in 500 and 1,000-pound capacities.

### Safety winch available in 1/2 and 1/4-ton models

An all-metal safety winch, complete with stirrup, has been introduced by Bil-Jax, Inc. The winch is available in two sizes with single-line capacities of 500 and 1,000 pounds.

A roller guide on top prevents wear on the steel cable. The heavy-duty-type unit is furnished with 100 feet of 1/4-inch cable, and the medium-duty model comes with 75 feet of 3/16-inch cable.

The stirrup is made to accommodate the all-metal swing stages produced by Bil-Jax, as well as other staging, up to a width of 30 inches.

For further information write to Bil-Jax, Inc. Archbold, Ohio, or use the Request Card at page 18. Circle No. 108.

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For more facts, circle No. 264

SEPTEMBER, 1956

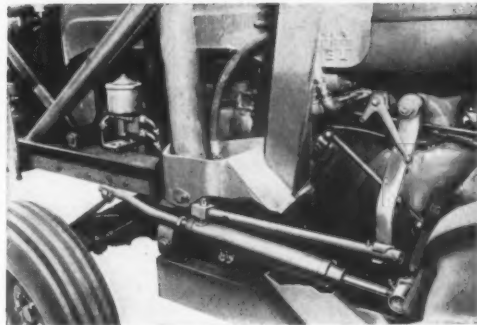
### Power steering unit for industrial tractor

The latest addition to the tractor accessory line of Sherman Products, Inc., is a new hydraulic power steering unit for use on the Fordson Major diesel tractor.

The Sherman power steering device comprises a combination hydraulic valve and cylinder that is actuated by the pitman arm of the tractor steering column. Hydraulic power to operate the cylinder and valve combination is supplied by a self-contained pump and reservoir unit, driven by a V-belt from the generator pulley on the tractor.

Adaptable to the Fordson Major tractor with all combinations of industrial attachments, the Sherman

The new Sherman hydraulic power steering unit installed on a Fordson Major diesel tractor.



unit reportedly eliminates side thrusts and shocks which normally tug at the steering wheel. The most important advantage of the unit, according to the manufacturer, is that it makes steering easier when the front of the tractor is weighted down by a heavy

attachment such as a Sherman front-end loader.

For further information write to Sherman Products, Inc., 3200 W. 14 Mile Road, Royal Oak, Mich., or use the Request Card at page 18. Circle No. 87.



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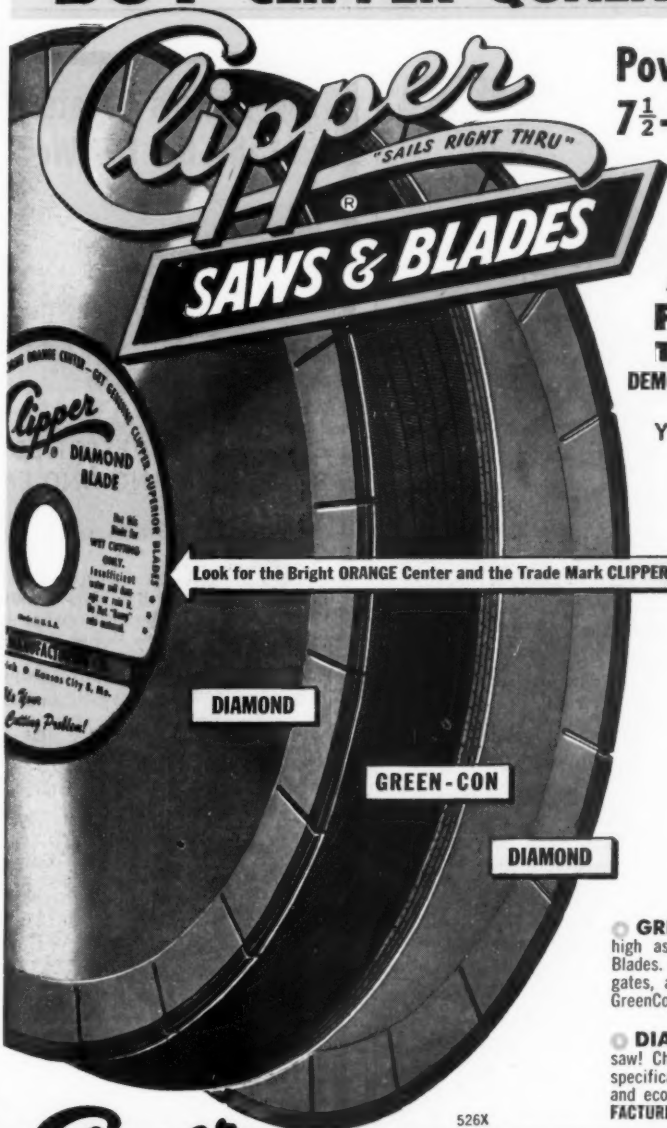
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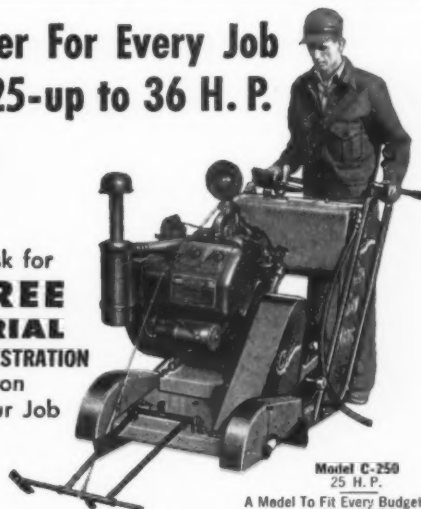
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Whenever possible, the jack-type units were set by a Dodge Power Wagon that uses a front-end boom and pickup fork to handle the entire assembly. The assembly and installation job required a force of 50 to 100 men.



Field assembly of the units is handled quickly. In the background, workmen bolt the three 16-foot-long 4 x 4 x 1/4-inch steel angle irons together, while men in the foreground string No. 6 wire through the frames.

## Fast-paced assembly, handling, rush work on jack-type jetties

Working against time, the contractor for the last phase of the Rio Grande Floodway project installed a total of 13,100 flexible jack-type jetties—the largest number built under a U. S. Army Corps of Engineers contract—and earthfill levees above high-water elevation to complete work on this three-year program on schedule.

When this last phase of the project

was planned, funds were limited, and it appeared that the project might have to be split; but after money became available in October, 1955, Miller, Smith & O'Hara, Inc., Albuquerque, N. Mex., subcontracted about 30 per cent of the earthwork on levees and moved a good roster of equipment to the site to meet the deadline. The \$1,754,000 contract included some 18

miles of earthfill levee requiring two million cubic yards of material, some 325 acres of clearing, and the installation of the jack-type jetties, which were designed by the Corps and manufactured by Miller & Smith Mfg. Co., Inc., Albuquerque.

### Several phases

The Albuquerque reach of the com-

prehensive Rio Grande Floodway project will help prevent floods like the one in 1894 which, according to old hydrograph records, shifted the river channel 500 feet westward, flooded low-lying parts of town, and tore out the only bridge across the river. It will also control floods of lesser magnitude, like the ones in recent years that caused millions of

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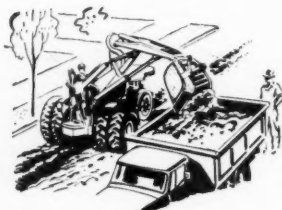
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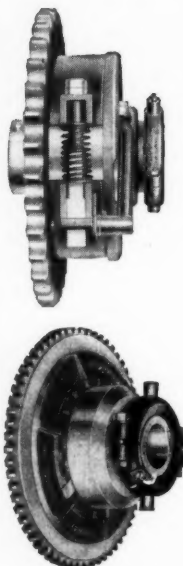
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CONTRACTORS AND ENGINEERS



One of the units, which can be carried by six men, is set in the water. It will be connected to other units by two strings of 7/8-inch-diameter cable and the entire jetty will be anchored.

### Total of 13,100 units, and earth-fill levee banks, complete three-year Rio Grande Floodway project

dollars in property damage.

Stretching about 18 miles from the Bernalillo-Sandoval county line to the mouth of Tijeras Arroyo, south of Albuquerque east of the river, the new system was constructed in several phases. A tieback levee from the north end of the project to high ground was built under phase 1 by W. H. Gilliard Co., Albuquerque. This work, done

under a \$67,000 contract, keeps the river from seeking its old bed and pouring into Fourth and Second Streets N.W. in the city. Phase 1A saw the installation of \$250,000 worth of jetties at strategic points along the north end of the project. These will slow down swirling waters at the toe of levees and make sand and debris

(Continued on next page)

Concrete pipe, which will serve as a longitudinal relief drain under the levee, is laid almost continuously by a Gar Wood Buckeye 160 trencher. It is equipped with a pipe-handling boom and hoist, a skip for gravel, and a steel box that places gravel around the line.



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(Continued from preceding page)

settle in the river. This work was done by Kellner Jetties Corp., Topeka, Kans.

Under phase 2, about ten miles of levees were built and existing drainage ditches rehabilitated by List & Clark Construction Co., Kansas City, Mo., from the tieback levee to the north limit of the Miller, Smith & O'Hara contract.

Completion of the latter contract provides a system designed to handle water at a rate of 42,000 cfs—about 17,000 cfs more than was created by the 1894 flood. The new levees, 9 feet high and with a 12-foot service road along the crest, are generally 40 feet closer to the stream than the old patchwork levees they replace. The flexible jetty units form a double main line 120 feet out from the levee toe, with tieback lines of the units, spaced at 125 foot intervals, slanted 45 degrees from the main line to the levee toe.

The jack-type jetty units, composed of three 16-foot-long  $4 \times 4 \times \frac{1}{4}$ -inch steel angle irons bolted together at the mid-points of the angles, were installed at a rate of a maximum of 250 daily, depending on the weather conditions. Work was on an 8-hour day, 5-day a week schedule. To get this production, the contractor used a crew of between 50 and 100 men for jetty assembly and installation, and a fleet of seven Dodge Power Wagons with Ramsey cable winches and short, front-end booms with pickup forks. The Power Wagons were used, wherever possible, to place the units. Six men were able to pick up a jetty unit and carry it 100 feet—a job which was sometimes necessary in places where the line reaches far into the river.

The unit is constructed with angle irons, bolted at the angle mid-points, being placed back to back with their longitudinal axis at right angles to each other. When bolted, the angles form three sets of intersecting planes, with a common joint at the center of each unit. These are developed by interlacing them with No. 6 steel wire, strands of which run parallel to each other on the 15-inch spacing in each plane. Angles were set in a jig at the factory and connection and lacing holes were punched in one operation, so that any three angles could be used to make a unit in a fast and simple field assembly.

Miller, Smith, & O'Hara used a mixed crew composed of ironworkers and laborers to build the units. Angles, bolts, and wire were delivered to placement sites by truck; then the angles were bolted together by ironworkers, who used a pedestal-type jig. Other workmen threaded the wire, making the units ready for installation.

As units were placed, they were aligned, then interconnected by two strings of  $\frac{3}{8}$ -inch-diameter cable. Cables were clamped together on each side of each unit at the mid-point. They extend in a continuous line through the units and were fastened at each end of the jetties to anchors. These usually consisted of a standard

6-inch  $\times$  8-inch  $\times$  8-foot creosoted railroad tie. Concrete anchors were used where the units had to be placed in the river channel. In long jetties, where back-up retard lines were not used, intermediate anchors were set every 200 feet.

The completed jetty unit is flexible enough so that it retains much of its protective value, even when it is undermined by scour. The entire system has proved extremely effective for bank protection in the 10 to 20-foot range in shallow, sediment-laden streams such as the Rio Grande and Arkansas Rivers. Five such jetty jobs have been completed on the Arkansas

River, and several on the Rio Grande, by the Corps, while state highway departments, railroad companies, cities, and counties, have installed the units on the Cimarron, Republican, Purgatoire, Red, and Rio Galisteo rivers.

#### Levee construction

The two-million-cubic-yard earthwork item, completed in the 8-month period allowed for construction, called for the installation of a 12-inch perforated concrete pipe drain and pressure relief system that lies longitudinally under the levee embankments. If floodwaters back up to maximum design level, so that only three feet

of levee freeboard is showing, engineers expect this drain system to collect water infiltrating to the phreatic point and discharge it through a transverse system inland from the levee embankment.

The most difficult part of this work was burying the concrete pipe in a gravel blanket 5 feet under the levee. Miller, Smith & O'Hara handled the job by rigging a Gar Wood Buckeye 160 trencher with a pipe-handling boom and hoist, a sheet-steel boxed-in enclosure that follows the machine to enclose the line with gravel, and a skip for handling gravel. These attachments put the pipe-laying opera-

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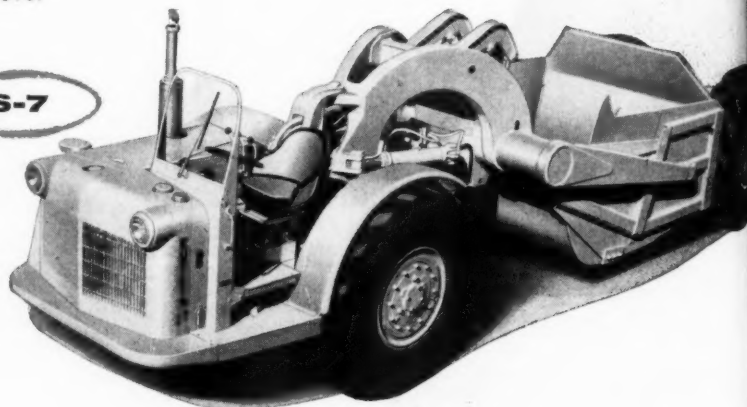
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Customer acceptance and preference has made "Euc" Scrapers the fastest selling line in the industry. The simple, practical design of every Euclid scraper model is years ahead of the field in ease of operation and maintenance and in production performance. Like all other Euclid earth moving equipment, "Euc" Scrapers are built to stay on the job longer with less down time for servicing and repair. For example, lever

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S-7

The S-7 has better than 20 h.p. for each yard of payload—a 143 h.p. engine and 7 cu. yds. struck capacity. It's primarily designed for small yardage jobs and for work in close quarters where maneuverability is essential—non-stop turning width is 28 ft.—tires are 18.00  $\times$  25 with 21.00  $\times$  25 optional for work in sand or other tough job conditions.



S-12



For medium size jobs or as a utility machine on large projects, this S-12 is the answer. Payload capacity is 12 yds. struck and 16 yds. at 1:1 slope. Powered by a 218 h.p. engine, this model has a top speed of 28 mph with full payload—makes a non-stop 180° turn in 31 ft. Tires are 26.50  $\times$  25—width of cut is 9' 6".

**EUCLID DIVISION**  
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tion on an almost continuous basis. In fairly dry, firm sand, the rig laid up to 100 feet of pipe per hour.

Levee - embankment construction began when the pipe was laid, a west-bank levee being subcontracted to Jack Adams, Santa Fe, N. Mex. The general contractor's dirtmoving fleet included two Allis-Chalmers TS-300 motor scrapers, three Heiliners, and three conventional LeTourneau-Westinghouse scrapers. Five Caterpillar D8 tractors, two with supercharged engines, were used for scraper and dozer work. An International TD-24, and three Allis-Chalmers tractors—two HD-20's and an HD-21, were used

for push loading. A D7 with dozer finished the side slopes while two motor graders bladed the tops of the levees, roadmixed gravel, and bladed the surface of the service road. While borrow areas were pre-sprinkled, several 3,500-gallon truck-mounted sprinkler units were also used to moisten fill material. Compaction was obtained by two sets of Gebhard 60-inch sheep-foot units and a Ferguson 50-ton compactor, ballasted with sand.

Borrow material, consisting of alluvial river sand and silt, was obtained from two sources: the old low levees that were built in the 1930's by the Middle Rio Grande Conserv-

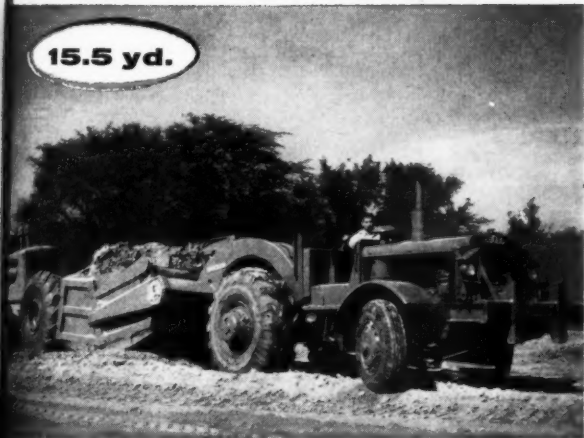


A load of fill for a levee is picked up by a scraper that is pushed by an Allis-Chalmers HD-21 and pulled by a Cat D8. The material comes from a drainage ditch that will be used by the USBR.

RS 7 to 18 yds. struck payload • 143 to 518 h.p.

for a wide range of work—small jobs to big projects

15.5 yd.



This 15.5 yd. Scraper has built-in performance that gets more work done. It is powered by a 300 h.p. engine with either a 10-speed transmission or Torqmatic Drive—has a heaped capacity of 21 yds. at 1:1 slope, 18 yds. at 3:1. Cutting width is 10 feet. Drive tires are 24.00 x 25 standard with 29.50 x 25 available as optional equipment. The extra speed and stability of this "Euc" really pays off on long hauls.

S-18

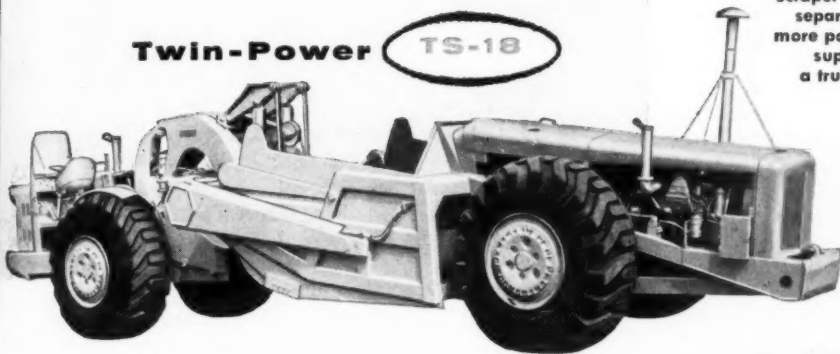


With Torqmatic Drive and 300 h.p. engine, the S-18 hauls heaped loads up to 24 yds. at fast travel speeds—struck capacity is 18 yds. Standard tires are 27.00 x 33 with 33.50 x 33 optional for maximum traction and flotation on tough jobs. In spite of its size and capacity, the S-18 makes a non-stop 180° turn in only 36 ft.

The TS-18 is the most recent development in the Twin Power principle pioneered by Euclid. It is powered by two 218 h.p. engines—one in the tractor and one behind the scraper bowl. Both engines drive through separate Torqmatic Drives. Where even more power is required the tractor can be supplied with a 300 h.p. engine. It is a truly self-loading machine due to its tremendous power and traction—works on grades and under conditions that stymie other scrapers and is a one-man earthmoving outfit. Standard tires are 27.00 x 33—with 33.50 x 33 available as optional.

Twin-Power

TS-18



For profitable scraper production and performance

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FOR MOVING EARTH, ROCK, COAL AND ORE



ancy District and the drainage ditch excavation. The U. S. Bureau of Reclamation and the Corps of Engineers worked closely to make this project economical and well integrated. The two agencies even pooled some funds for various work beneficial to both. The dragline excavation for ditches created irrigation canals for the USBR, while the Bureau of Reclamation furnished some of the money for the graded gravel service roads that will permit Bureau employees to make their rounds faster.

When drainage ditches were being excavated, the grading fleet worked down to the water table—which was usually about three feet above the designed bottom of the ditch. Then a Link-Belt Speeder K-365 dragline with 2½-yard Hendrix bucket started casting the remaining material to the top of the levee. A P&H ¾-yard dragline was also used for excavating.

The borrow material was laid in 12-inch lifts, and if additional water was required on the fill, it was supplied by water trucks. Eight passes of the sheepfoot units, or four by the pneumatic compactor, developed the 90 to 95 Standard AASHO density.

The 2½ to 1 levee slopes were dressed by two tractors dragging a steel railroad rail between them. One tractor operated on the crest of the levee, the other worked at the toe as two passes were made with the rail. The windrow left at the toe was leveled by a tractor with dozer. The last work consisted of putting down the gravel road surfacing and protecting the inboard slope of the embankment with a gravel blanket.

Subcontractor Adams, using the same methods as the general contractor, had a spread that included four DW10's with No. 15 scrapers, an Allis-Chalmers HD-20 for pushing, several D8's with dozers, and a new D9 with a No. 90 Caterpillar scraper.

The project is part of the civil works flood-control program that is supervised from the Albuquerque office of the Corps of Engineers by district engineer Col. Robert E. Cron, Jr. Col. Walter A. Faiks is executive officer, James Loughridge is chief of the construction division, and Ray Lunsford is resident engineer.

All three owners of the general contracting firm, P. D. Miller, M. W. Smith, and John O'Hara, took an active part in supervising the work, using a Motorola two-way radio system to communicate with each other and coordinate the job.

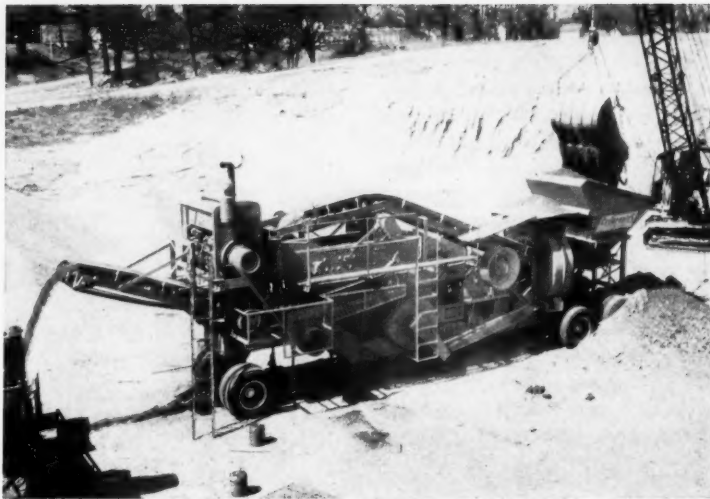
THE END

For more facts, circle No. 270

## Redesigned crushing unit has greater versatility

■ The Cedarapids Junior Tandem crushing and screening plant has been redesigned to give it greater versatility and increased capacity, according to an announcement by the Iowa Mfg. Co.

A larger screening area is one of the new features of the redesigned plant. A half deck has been added to the horizontal vibrating screen, and the screen width has been increased by 6 inches over the old model. The 42-inch x 10-foot, 2½-deck screen on the new Junior Tandem not only increases screening capacity, but also adds flexibility for producing from one to three products simultaneously in sizes ranging from 2-inch road ballast



The newly redesigned Cedarapids Junior Tandem crushing and screening plant.

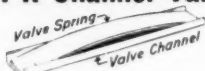
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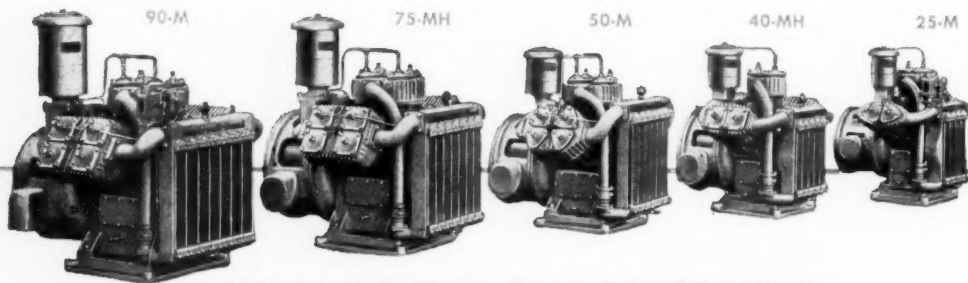


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Newest addition to the Ingersoll-Rand line of Type 40 compressors, this heavy-duty, air-cooled unit offers new convenience and economy for the generation of 80-125 psi air power in the 125 hp class. Shipped fully assembled, its compact, well-balanced design and small foundation requirements cut installation costs. And efficient two-stage compression with intercooling to near ambient temperature, reduces power costs all year around.

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 271



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Secondary crushing is handled by either a 24 x 16-inch or a 30 x 18-inch roll crusher. For average conditions in the pit, the capacity of the smaller secondary crusher is adequate for balanced plant operation. Where percentages of fines are high, or where greater over-all plant capacity is desired, the larger secondary crusher with its 18-inch width is said to increase secondary crushing capacity by 11 per cent, while the 30-inch-diameter roll permits feeding bigger material so that the primary crusher jaws can be opened wider.

For further information write to Iowa Mfg. Co., 916 N. 16th St., Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 95.

## Announce winch kit with 6,000-pound unit

■ The Braden Winch Co. offers a new winch kit made up of a 6,000-pound-capacity front-end winch and all necessary fittings. The winch, designated the MU3-2, is designed for use with the new 1956 International S-120 4 x 4 truck.

The kit is said to be easily assembled and installed in about four man-hours with ordinary tools. Neither the frame nor grill has to be cut. The only cutting necessary is the opening in the front of the bumper to permit spooling of the cable.

The unit is designed to fit the Warner T-9, special transmission, left-hand opening. Either flexible or lever controls are available.

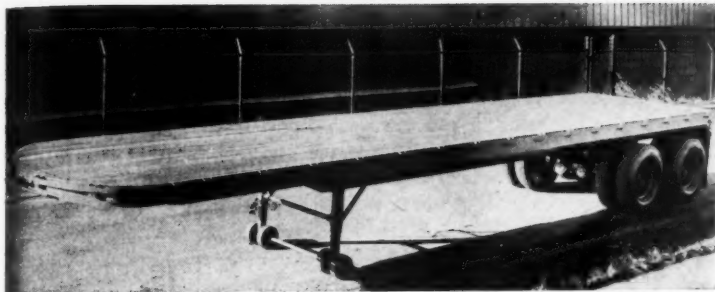
For further information write to the Braden Winch Co., P. O. Box 547, Broken Arrow, Okla., or use the Request Card at page 18. Circle No. 86.

## New line of tractors

■ The new Massey-Harris-Ferguson line of industrial tractors, called the Work Bulls, is featured in a catalog from the company. The 34-hp Model 202 is shown with a 9-cubic foot loader and backhoe; with a backblade and an 11-cubic foot loader; and with a 4,000-pound-capacity fork-lift. The Model 303 is a 42-hp unit for medium-duty all-purpose work, according to the catalog. A low center of gravity and large working tires are among features of the 52-hp Model 404, the catalog states. Also pictured and described is the Davis Pit Bull. Job photos, specifications, and full information on attachments are included in the catalog.

To obtain the catalog write to the Industrial Division, Massey-Harris-Ferguson, Inc., 1721 Packard Ave., Racine, Wis., or use the Request Card that is bound in at page 18. Circle No. 54.

CONTRACTORS AND ENGINEERS



### Heavy-duty trailer handles 25-ton load

■ A new semitrailer, heavy-duty tandem platform that will carry up to 25 tons of uniformly distributed payload is available from the Highway Trailer Co. The rig is recommended for hauling cement blocks, sacked cement, construction steel, and other extra-heavy freight.

The structural steel 8-inch channel side members and the pressed steel cross members of the Model 8's platform frame are supported by a full chassis frame. The front steel WF beams are flush with the floor. The platform is available with either a square or oval front.

Other features of the platform include ICC drop-type bumper, two-speed vertical supports, and ICC-SAE lights with ATA color-coded wiring.

For further information write to Highway Trailer Co., Edgerton, Wis., or use the Request Card at page 18. Circle No. 11.

### Trench cutter

■ The Everett trencher, capable of digging to a 42-inch depth and to 18 inches in width, is described in a folder from the manufacturer, Earth Equipment Corp. Job photos show the rear-mounted units which are made for Ford and Ferguson tractors. According to the bulletin, the built-in V-belt safety-slip clutch automatically stops the bucket line and prevents damage when obstructions are encountered. The complete specification listing includes data on the buckets, bucket teeth, chain and sprockets, tractor-speed control, and back-filling attachment.

To obtain the bulletin write to Earth Equipment Corp., 2036 Sacramento St., Los Angeles 21, Calif., or use the Request Card at page 18. Circle No. 131.

### V-belt tips

■ Two mailing pieces from Worthington Corp. give helpful hints on how to prevent and diagnose trouble in V-belt drives. Cartoon-type drawings in both mailers illustrate each trouble-saving tip. One of the mailers points out how to select proper drives, install drives and belts, keep sheaves in good condition, and adjust belts. The second mailer is devoted to the symptoms, diagnosis, and cures for V-belt failures.

To obtain Mailers V-1400-M38P and V-1400-M40P write to the Worthington Corp., Worthington and Harrison Aves., Harrison, N. J., or use the Request Card that is bound in at page 18. Circle No. 143.

For more facts, circle No. 272→

### Tire handbook

■ A truck operators' handbook on the B. F. Goodrich on and off-highway tires is now available. Included in the booklet are a tire-selection chart, and load and inflation tables for tires in highway, earthmoving, and road-grader service. A section on tire care covers such subjects as inflation, load analysis, the effects of heat, mechanical irregularities, matching and spacing of duals, and storage. Also discussed are the improvement of tires and how to extend tire life. Data is given on tubeless truck tires, nylon construction, and

the company's complete line of tires.

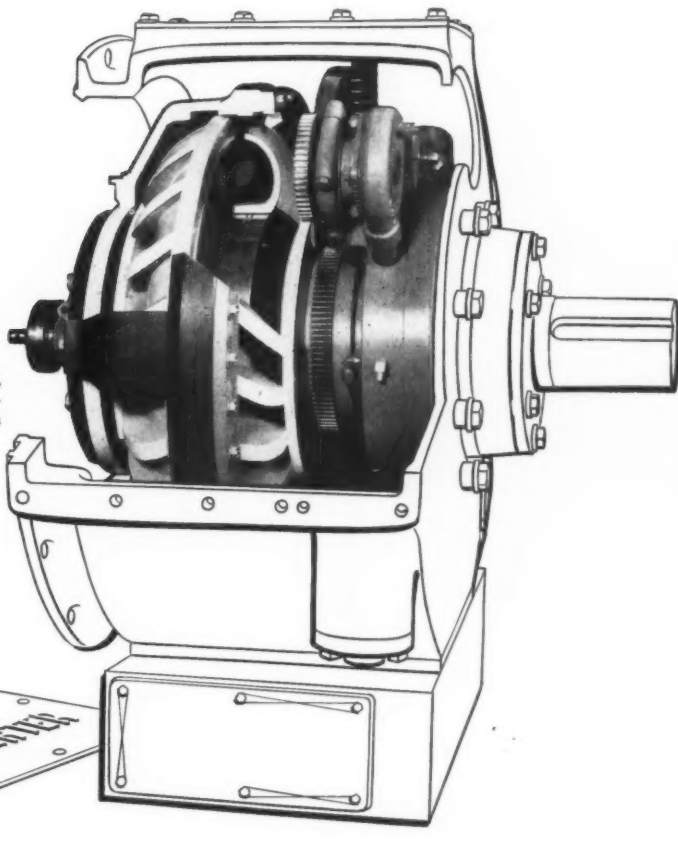
To obtain the booklet write to B. F. Goodrich Co., Tire & Equipment Division, 500 S. Main St., Akron 18, Ohio, or use the Request Card at page 18. Circle No. 41.

### Pioneer appointment

Fred W. Hartlage has been appointed sales-promotion manager for Pioneer Engineering Works, Inc., Minneapolis, Minn., manufacturer of asphalt-paving equipment. He had formerly been associated with Baker-Lull Corp., Minneapolis, Minn., and with a Midwest advertising agency.

The Model 8 heavy-duty, tandem platform trailer, product of Highway Trailer Co., is recommended for hauling extra-heavy uniformly distributed payloads.

A cutaway view of a National Torque Converter, showing simplicity of design, ruggedness of construction, and the high quality of fabricated parts



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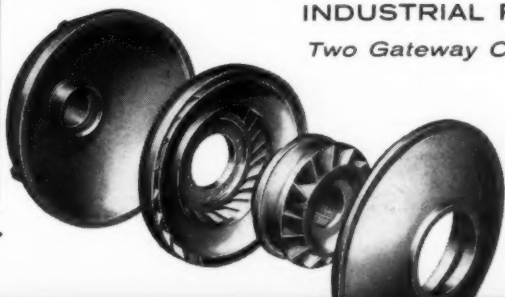
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A copy of Bulletin No. 468, descriptive of National Torque Converters, is available on request.

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*Pace-setters in the progress of  
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The following article is an excerpt from the book, "Modern Techniques of Excavation", by Herbert L. Nichols, Jr., published this year by North Castle Books, Greenwich, Conn. Mr. Nichols is well known as the author of "Moving the Earth" and "How to Operate Excavation Equipment", excerpts from both of which have appeared in these pages. "Modern Techniques of Excavation", a shortened and revised version of "Moving the Earth", is priced at \$9.00.

## Defects in Equipment

Manufacturers of heavy equipment have reason to be proud of their products. Any earthmover is an intricate, ingenious, and practical machine, and is the product of years of research, testing, and trial and error.

Under such circumstances, criticism may seem in questionable taste. But the operator, the mechanic, and the contractor—not to mention the distributor, who must keep these three satisfied—all know that most machines are far from perfect, and that many of their failings seem unnecessary.

The contractor cannot take it for granted that a piece of equipment is either well designed or well built, even if it is produced by a company with an old and honored name and a currently good reputation. Black sheep

are as common in good families as in bad.

Few earthmoving machines are ready to work with full efficiency when they leave the factory. Correcting omissions and built-in mistakes of the manufacturer is one of the major headaches of conscientious equipment distributors. Necessary work ranges from simple but costly procedures such as hardface welding on too-soft teeth and edges to elaborate reconstruction and replacements. They may receive partial compensation from the factory for such work, but often they do not.

### Causes

Difficulty with new equipment can arise from poor design, poor workmanship or material, or from both. In regard to the first, it often seems to the users that if each manufacturer had in his employ one reasonably intelligent and open-minded high school boy with authority to pass on new models, most of these troubles could be avoided. The writer is inclined to agree.

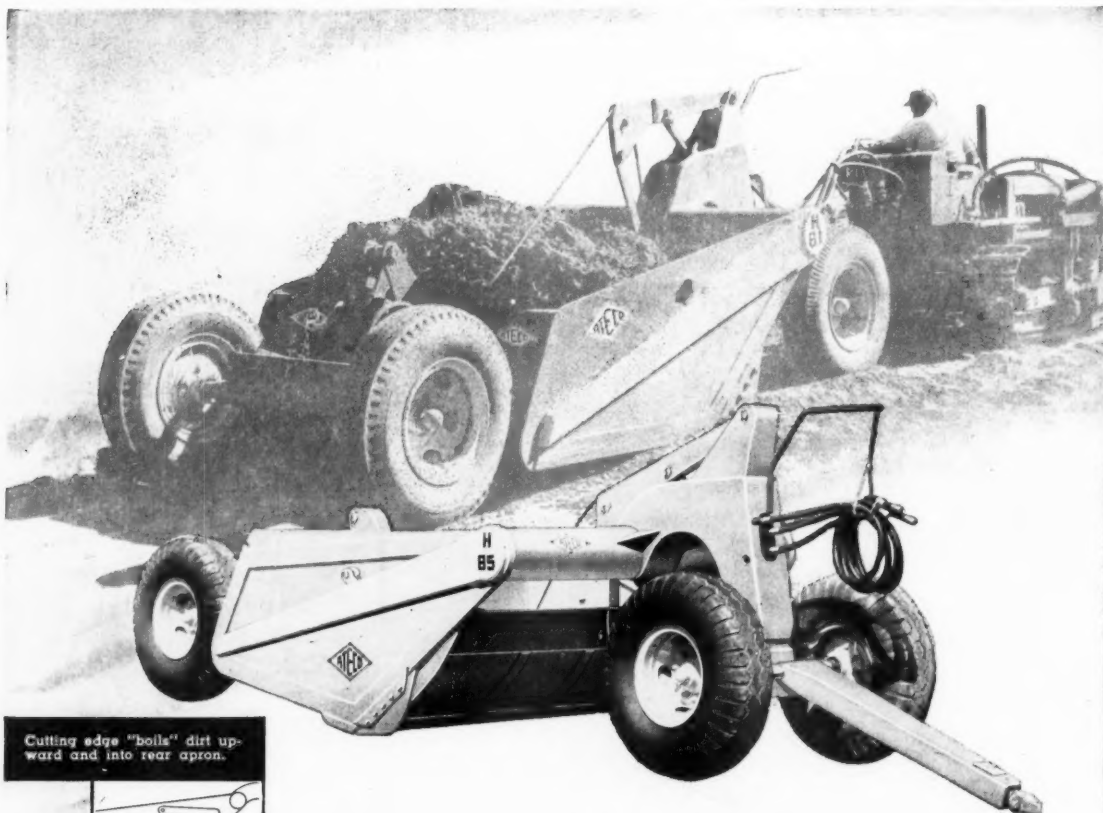
Many defects indicate a serious gap between desk and drafting-room theory and the hard facts of working on the job. The question of why theory cannot grow up to include the facts is interesting.

One clue is that in the course of the years a contractor might see almost every kind of manufacturer's representative, including salesmen to bother him when he is busy, trouble shooters to tell him that he is imagining his difficulties or abusing his machines, and even the president of the company addressing an association meeting. But has any contractor ever been called on at work by a design engineer interested in hearing what is wrong with equipment, and what he would like in new models? Very doubtful.

However, there is no question but what the manufacturer has his problems. Each model is built to a size, weight, and price, and one or more of these limits may prevent inclusion of certain desirable features. Mistakes inevitably occur in translating plans into metal, and when tens of thousands of dollars may be invested in patterns and tools to make a single part, the temptation to make the best of its defects is certainly strong.

Some of the more obvious and apparently inexcusable mistakes in a new model arise from field testing. Pilot models are built and used, and various defects show up. Corrections are made, but when production models appear, secondary defects are found, due to the altered parts not working in as well as expected. By the time these mistakes are caught, hundreds of the machines are at work, and corrections must be made in the field by the distributor organization. Some such errors are inevitable, and as long as they are made good with reasonable promptness, they should not be held against the manufacturer.

However, mistakes in basic design and in partial corrections, together with ordinary defects in material and workmanship, often add up to a machine that costs the contractor more



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in downtime and upset schedules than it produces in work, even without considering the original investment. The promptness and efficiency with which the distributor services the machine, and the vigor with which he presents the owner's case to the manufacturer, are important in determining whether such a "lemon" will constitute a serious loss or just an annoyance.

Each contractor and operator has his own pet peeves about equipment. Those that are listed below are fair samples.

#### Inconveniences

The standard method of fastening a detachable rig, such as shovel front end or a dozer shovel bucket, to the main machine is by knockout pins. When the attachment is being installed, each pin must be put through three or more holes in heavy pieces. If the pin is cut straight across the ends, the parts must be exactly in line. However, if one end of the pin is extended and tapered it can correct considerable differences in alignment as it is driven through. The pin must, of course, be of hard steel so that it will keep its surface intact.

Properly beveled pins will save from one quarter to three quarters of the time needed to install almost any kind of a rig, and may be absolutely necessary to a man working alone. All mechanics, operators, and factory field men know this, but production lines continue to put out straight-cut pins, or those with practically no bevel.

When a cable is being threaded around a boxed-in sheave, it tends to push against the back of the box and stop there, so that crimping and fishing are needed to get it around. This annoying difficulty is easily eliminated by installing a curved plate which will direct the cable the way it should go.

Such guide plates have been in use for at least 50 years, but equipment is still coming off the assembly lines without them.

#### Unfinished designs

A 4-wheel-drive bulldozer was delivered to the writer as a rental. This model had been introduced about a year before, and was a brilliant, progressive piece of engineering that included many basic advances now widely copied. But if the blade was raised all the way, either by the cable or by being kicked up by its load, a sharp edge would pin the cable against its shallow-groove pulley and cut four of its six strands as neatly as a cable cutter. Also, if the cable was allowed to get at all slack, it would spill off the side of the drain.

Correction of these defects would have cost the manufacturer less than five dollars, although it took a welder over four hours in the field. The factory was notified of the difficulties and of the simple changes that cured them, but for the next two years it continued to put out the machines in the same condition. The distributor made a routine job of fixing them before delivery, as he found it was cheaper than answering complaints and supplying free cables and extra hours of instruction.

An otherwise excellent 1-yard shovel dozer was put on the market with only eight 3/4-inch cap screws to hold its three tons of live weight down on the tractor. Of course they stretched and broke about as fast as they could be replaced. Distributors who liked to see their customers get steady work out of the machines were forced to reinforce the connections by welding on heavy plate.

After a long time, the factory worked out a new method involving heavy tapered bolts that was absolutely secure. Too secure, in fact, because it was virtually impossible to remove the attachment after it had been in service for a while.

A revolving shovel that was supposed to be able to handle a 3/4-yard dragline bucket on a 40-foot boom

was produced for years with only four 1 1/4-inch bolts to fasten the turntable to the undercarriage. This manufacturer was sufficiently aware of the mistake to do free welding on one broken undercarriage after 30 months of service, but insisted that it be done the factory way instead of the right way.

This breakup cost the customer over \$1,000 to take the shovel apart for the job, put it back together, and hire a substitute machine, and the base broke up again in two years. New shovels of this model now have 12 bolts and heavier bracing, improvements that any mechanic would have insisted on in the first place.

#### Power controls

Power controls offer an interesting

study in both manufacturers' and operators' psychology. For years the operator was supposed to be (and pretty much had to be) a tough beefy individual who could pull and push and haul on clumsy levers, crank heavy engines, balance fuel cans and funnels in improbable places, and do it every day, ten hours a day. Little attention was shown to the problem of making the machines easy to run and service.

However, the operators apparently thrived. The first crawler tractors to feature electric starters, reasonably easy controls, and other conveniences were considered effeminate and unworthy of serious comparison to the good old brutes, and progressive models of other excavators did about as badly.

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larity, and power controls, easy-shift transmissions, and other conveniences are now offered in great variety. However, many of them are of very questionable quality. There is (or was very recently) a small shovel with air controls. The valves were poorly balanced and jerky, and the operating levers were backed by such stiff springs that it took over twice the effort to open the air valves than it did to engage the clutches and brakes mechanically in the previous models.

Another prize package is a crawler tractor with hydraulic booster for the steering clutches, the pump for which is in the transmission. When the master clutch is disengaged, so is the booster. If the machine is moving, the steering clutches take less than a 5-pound pull; if it is stopped, over 60 pounds. And in tight quarters, a man often needs to pull a steering clutch before he starts moving. The main clutch and the brakes have no booster.

Easy-shift transmissions have found their place even in big crawler tractors. However, if the manufacturer provides a torque converter so that only two forward speeds are needed, he may go back to the primitive bash-and-clash shift which, with these heavy gears, takes far too much of the operator's strength and of the machine's excessively expensive time. The contrast between the miraculously smooth automatic shifting of the torque converter through an infinite range of speeds, and the crude, heavy work-wasting forward-reverse gear shift behind it should appall any designer, particularly as smooth and rugged reversing clutches have been available for many years.

Fortunately the torque converter is now teamed more and more often with transmissions that clutch-shift on the move in either direction without effort, noise, or delay. Some of these more modern machines have their troubles, particularly in too-sudden engagement of air clutches that may shock and damage the power train, but their production is always far higher than the old fashioned constructions of similar weight and power, and they are on the right road.

The electric starter was standard equipment on most automobiles by the middle twenties, and might reasonably have been expected to appear in construction machinery at the same time. However, it took twenty years and a mechanized world war to make it universally available even as optional equipment.

There never could have been any serious argument about the desirability of electric starting for any machine able to carry the extra weight and cost. It means more work hours, particularly in cold and wet weather, and an end to broken wrists and strained backs from cranking. It is simple, and it is cheap compared with the cost of a tractor or a shovel. Yet its adoption lagged for a generation.

#### Basic shortcomings

A very common mistake in design is the use of an undersized clutch that requires frequent adjustment and re-

placement. The experienced repairman can frequently spot such units on the showroom floor. Simple common sense indicates that if an engine is made more powerful, if a tractor is made heavier, or if mounted attachments involve more clutch wear (for example, stepping up from bulldozer to a shovel dozer), then the clutch must be increased in capacity. But it often is not.

A shovel dozer must exert its maximum lift at a low level in order to break its loaded bucket out of the

ground. One of the earliest designs included a bucket that could have its lip rotated upward from digging position, giving a powerful prying effect with the back of the bucket as a fulcrum. Yet not only was this excellent construction ignored for years by all the big companies, but one of them after years of research produced a machine in which the hoist rams and the lift arms were nearly parallel when down, so that hoist leverage was at a minimum at breakout point and became steadily stronger as it was

lifted through the air.

An ordinary dump truck body can be raised to a maximum angle of around 50 degrees, because it comes down by gravity, and greater lift might overbalance it so that it could not be lowered. This slope is usually adequate for easy dumping on the level, but works very badly with sticky loads and when backing up a grade.

Big off-the-road trucks have power both up and down in their hoists, and can raise to 70 degrees or more. Recent inquiry showed that this excel-



## How to get more out of your tractor

**STUDY POWER** ... Power is of prime importance, but, today, you need to consider engine horsepower as a *source*, not a "force". Maximum horsepower ratings considered alone are without meaning. Ratings must be studied across the speed range to measure their effectiveness in push-pull effort at desired operating speeds. Also, you need to check the smoothness with which power is applied; the time-factor in making a deep cut, and the difficulties in shifting which may discourage an operator from using the proper gear ratios to apply power with greatest time efficiency. Check, too, the percentage of time where you use the combination of power and traction for maximum push-pull. You will find power at maximum "drawbar" is seldom used for tractive effort. Since *all* tractors are able to spin their tracks or wheels in low gear on normal footing, horsepower should be considered only as a power source ... available for use in *any direction*. The most effective power combination lets you work at highest practical speeds which job conditions permit. (See table at right.)

**STUDY TRACTION** ... Pounds-pull is a combination of power and traction. Compare it ... but your desired operating speeds. Usable pounds-pull results from many factors: type of material, condition of underfoot, weight of tractor, and forward speed. From the table at right, you can see that Tournatractor pounds-pull compares favorably with track-type tractors from 2.0 mph up. Even if Tournatractor takes thinner initial cut, its time advantages in stepping speeds, gives you a faster overall cycle. Wide-tread rubber tires now available on Tournatractor can give still more traction on rubber. Its anti-friction design and minimum of moving parts give you far less loss in power transmitted to ground-contact. It eliminates loss of power due to accumulation of mud and dust on tracks. Its compaction characteristics give a major advantage on fills and haul roads. Its low-pressure cushion and flexing rubber-treads can provide better traction than crawlers in many materials. They permit work and travel without planking over pavement, curbs, and rocky footing.

lent and much-needed feature was not available even as an extra price option on any popular small truck body, even though the design and construction problems are slight.

The dump hoist pump is usually driven from the transmission, so that it does not operate when the clutch is down. The valve is likely to be jerky, so that it cannot be held partially open and the body will be lifted at full speed or not at all. In ordinary dumping such features are all right, but when a driver is trying to spread

a load, or to dump only part of it, they combine to give him a very hard time and produce a sloppy job. Hydraulic pumps could be driven directly by the engine, and valves could readily be made to open gradually and smoothly, so that the driver could be given exact control of the hoist.

#### Hydraulics

Hydraulic power transmission has striking advantages over cable and mechanical linkages for close-cou-

pled attachments. It may be expected to continue to widen its applications and to displace its competition. However, much of its progress is made in spite of rather than because of the efforts of many designers and manufacturers of hydraulic equipment.

A hydraulic valve can and should offer a perfectly smooth transition from neutral or hold to fully open position. There are few applications where the resulting control of speed is not desirable. Also, such a construction requires excellent balance

and therefore provides easy operation. Problems of heating and turbulence can be solved.

Valves that tend to jump from one position to the next, or are so poorly balanced that they are hard to push past certain points, are fatiguing to operate and difficult to control, and give hydraulic systems a bad name. Yet they outnumber the good valves two or three to one.

In the early forties, most hydraulic rams had heavy wick packings and compression nuts to prevent oil leakage along the piston rods. These required adjustment only at long intervals, and seldom leaked. They were replaced by the smaller and neater chevron or V-packing, and for a few years lots of equipment had more of its oil outside than inside. Improvements in quality of the packings and chrome plating of piston rods finally stopped the excessive leaking and need for adjustment, so that now these packings are practically as good as the old type. However, the streamlined appearance that was gained is hardly worth the damage to industry prestige suffered during the development period.

Designers of hydraulic equipment tend to be stingy in figuring range of action, on the basis that every inch of potential movement costs either money or power. This economy results in bulldozers that cannot reach down far enough to start cutting a ramp without backing up on a pile nor reach high enough to push over a tree, loaders that can barely get their bucket over the side of a truck, and scarifiers that will not lift out of the way. Undersize pumps and rams work well when the machine is new, but deteriorate and fail long before really adequate units in the same work.

#### Fuel tank

Dirty fuel is one of the chronic troubles of engines. This is particularly important in the excavation industry, as much of the machinery is fuelled from drums or cans instead of direct from a pump or tanker. As a result, it is difficult to keep the fuel clear of water, dirt, paper, leaves, and other foreign material.

Equipment that stands idle tends to accumulate water in the tank from condensation. Fuel tanks of untreated metal and those which have been inadequately treated may rust and scale, thus contaminating the fuel.

These unwanted and damaging extras are kept out of the carburetor or injectors by one or more filters in the line. Their flow and reservoir capacity is usually small, so that dirty fuel will clog them frequently. Partial clogging results in poor performance which may continue for some time before the cause is found. Cleaning a filter requires stopping the machine.

Foreign material frequently clogs the fuel line between the tank and the filter, usually at an elbow just outside the tank. Such an obstruction can often be temporarily removed by blowing back with air pressure, but eventually the line will have to be removed and cleaned.

Fuel filter holes are often too small

**BY SPEED** ... Speed today is a major dimension in every piece of equipment you use. For crawler engineers have struggled with this problem. They have made improvements, but find it difficult to overcome the friction-losses and wear-costs involved in stepping-up crawler speeds. With 4-wheel-instant-shift, constant-mesh transmission, torque converter, instant controls, and anti-friction-drive, Tournatractor has a combination of speed factors not met by any crawler. With twice top-speed of 4-duty crawlers, today's Tournatractor has many savings in each cycle that contribute to its speed performance. You've seen the load build up on a crawler's blade, but have you checked the other components of the crawler's day? Carrying-the-load, return, wait-and-travel time, are all part of the cost and call for long-term time-study. Figure, the few times where crawler maximum-drawbar at speed gives you a production advantage; then compare with the much larger time percentage where extra can pay off in profit.

**BY MOBILITY** ... Crawler-moves, job-to-job from section to section, require moving in or out of flatbed, loading and unloading time, plus travel-time. These high moving costs make crawlers expensive on hit-and-run assignments. Yet large-area contracts need far more equipment than ever before. Tournatractor can be at a mile away in less than 5 minutes ... lets your crawler be as flexible as your prime-mover scrapers moving to a new area ... for instance, to work on borrow during wet weather. Mobility also gives flexibility to quickly balance pushers as well as scrapers when hauls vary. It lets you use idle time to move haul roads, detours, or drainage. It makes available ripper, stumper, or compaction serv-

ice anywhere on your project. Mobility is an important dimension in today's dirtmoving ... will be more important in your larger future. Think it over, remember some of your last year's projects and count the times when a 17.4 mph tractor could have saved you money and given you bigger profits.

Write for complete Tournatractor specifications.



Rubber-tired Tournatractor travels and works over any type of footing to clear land, push-load scrapers, dig ditches, spread fill, stock-pile materials, maintain haul roads, backfill around culverts, pull rippers, rollers and other equipment. The best way to judge today's improved Tournatractor is to see it in action on one of your own jobs. Call or write us today for a demonstration of this machine. Compare its profit possibilities with your present heavy-duty tractor equipment.

### Time study production relationship of pull to speed

TRACTOR	HP with torque converter	Speeds in MPH		Pounds of pulling effort			
		Forward	Reverse	1.5 mph	2.0 mph	2.5 mph	3.0 mph
CAT D8	191	0 to 3.6 low 0 to 7.4 high	0 to 3.6 low 0 to 7.4 high	30,000	24,000	18,000	15,000
IH TD24	200	0 to 7.6	0 to 6.6	32,500	22,500	18,000	15,000
TOURNATRATOR	208	0 to 17.4	0 to 7.3	24,700	23,500	18,800	15,650
AC HD21	204	0 to 3.0 low 0 to 7.5 high	0 to 5.5	Pounds-pull curve not shown in manufacturer's literature available to us.			

Figures taken from manufacturers' specification sheets available to us at time of printing.

Tournatractor—Trademark Reg. U.S. Pat. Off. CT-1150-G



**LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS**

A Subsidiary of Westinghouse Air Brake Company

ARBA



See you at the ROAD SHOW • Chicago • January 28-February 2, 1957

For more facts, use Reader-Reply Card opposite page 18 and circle No. 277

to take pour direct from a can, so that a funnel, which is a nuisance and a rich source of dirt, must be used. The filler is often so located that it is difficult or impossible to empty a can into it.

All these troubles could be cured by making the filler opening accessible and 5 or 6 inches in diameter, to permit a man to pour direct from cans, and to reach his hand into the tank. A high grade filter could then be installed on the fuel line inside the tank. The tank bottom would serve as an amp's reservoir for trapped water, and could be drained occasionally through a petcock. The filter element could be replaced when necessary through the filler opening. No coarse dirt could get in the lines to plug them, and engine filters would very


seldom need servicing.

It is difficult to get a tight seal on a large filler cap. If a slight seepage of fuel around it were objectionable, a smaller size could be used, and a bolted-on cleanout plate installed in the top of the tank.

Millions of dollars worth of machines have limped through unprofitable lives because of trouble with dirty fuel and corroding tanks. They would have done good jobs with this minor change. **THE END**

*Highway construction of all kinds in the 13-year period 1957-69 will require a total of 49 million tons of steel, 1,399 million barrels of cement, 128 million tons of bituminous material and 9,170 million tons of aggregate.*

## The New SMITH-FIELD AUTOMATIC CURB and GUTTER MACHINE



Lays up to 1,000'  
of Integral Curb and  
Gutter per day!

NO FORMS!  
NO HAND  
FINISHING!

SAVES  
TIME, MONEY  
AND LABOR

The SMITH-FIELD AUTOMATIC CURB AND GUTTER MACHINE operates on an entirely new principle by laying INTEGRAL CURB AND GUTTER without FORMS or HAND FINISHING.

Operation of the machine is simple. ASPHALTIC or PORTLAND CEMENT CONCRETE is fed into the hopper of the machine where it is extruded under pressure through the mold. The compaction developed through the extrusion process causes the machine to move along an angle iron track, where a continuous curb and gutter is formed at the rate of from 2-4 linear feet per minute.

Five men are required to operate the SMITH-FIELD AUTOMATIC CURB AND GUTTER MACHINE and up to 1,000 linear feet of curb and gutter can be laid in one day, under efficient methods.

With this new method, the cost of laying curb and gutter is very much less than under the conventional methods, resulting in a substantial saving to the user of the SMITH-FIELD AUTOMATIC CURB AND GUTTER MACHINE.

Write for full details and prices

### E. L. HARDIN ASSOCIATES, INC.

SALISBURY, NORTH CAROLINA U.S.A.

SOLE MANUFACTURERS AND DISTRIBUTORS—U.S.A. AND FOREIGN  
PATENT NO. 3,707,432—AND OTHER PATENTS PENDING

For more facts, use Reader-Reply Card opposite page 18 and circle No. 278



Platform area and truck clearance have been increased on the new Erie Strayer portable batching bins.

#### Platform area increased on portable batching bin

■ The new Erie Strayer PC-Series portable batching bins have 30 to 40 square feet more platform space than previous models. Also, 2 to 4 feet extra truck clearance has been provided. In addition to giving trucks more room, the wider spread between the columns add to the stability of the entire structure.

The new bins can be arranged for aggregate only, for a combination of aggregate and cement, or for use with additional ground storage facilities.

The bins are of the welded sectional type. They are made in two and three sections with two-piece platforms.

Detachable columns and braces keep space requirements for transportation and storage to a minimum. The top section of all compartments is in one place. The cement compartments are weather-tight.

For further information write to the Erie Strayer Co., P. O. Box 1031, Erie, Pa., or use the Request Card at page 18. Circle No. 15.

#### Wire-rope manual

■ A wire-rope manual is now available from Jones & Laughlin Steel Corp. The first two sections of the manual are devoted to selecting the correct wire rope for a job, and installing and operating wire rope. The third and fourth sections contain information on standard Jones & Laughlin wire rope construction, and the firm's fittings and slings. There are also general recommendations for ropes on standard equipment.

To obtain the manual write to Jones

& Laughlin Steel Corp., 311 Rose St., Pittsburgh 30, Pa., or use the Request Card at page 18. Circle No. 144.

#### Hyster names manager of Manhattan sales office

The Hyster Co., Portland, Oreg., has promoted Charles Gruet to the position of manager of the firm's sales office in New York, N. Y. Formerly northeast district representative, Gruet will supervise export and domestic accounts for the industrial truck and tractor-equipment division.

## FREE!

# acker

## drill supplies catalog



Write today for the big, new, 40 page Acker Drill Supplies Catalog. It illustrates and describes over 150 drilling tools and accessories that will save you time and money on auger borings, core drilling and soil sampling.

Yes, send me the new Acker bulletin 50 C&E

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

### ACKER DRILL CO., INC.

725 W. Lackawanna Avenue  
Scranton, Penna.

a complete line of Soil Sampling Tools, Diamond and Shot Core Drills,  
Drilling Accessories and Equipment

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 279

CONTRACTORS AND ENGINEERS



One man easily handles the Maginniss UCV-9 Uni-lectric vibrator.

### Self-contained vibrator operates on 110 volts

■ A new low-cost Uni-lectric concrete vibrator, capable of operating from any on-the-site 110-volt current—including the dc output of Maginniss Hi-lectric generators—and especially designed for use on smaller concrete jobs, is announced by Maginniss Power Tool Co.

Known as the Model UCV-9, the new motor-in-head concrete vibrator is lightweight and easily handled by one man. Its universal ac-dc motor is said to provide effective high-frequency, low-amplitude vibrations of up to 10 000 per minute in medium or high-slump concrete. The new vibrator is said to be ideal for use in vibrating floor slabs, footers, curbs, gutters, thin walls, culverts, and driveways, as well as for repairs and small pours on large jobs.

According to the manufacturer, the Model UCV-9 is completely self-contained and is easily carried in a car trunk or truck tool box. The vibrator is furnished with a 10-foot operating hose, heavy-duty concrete-proof operating switch, 50 feet of rubber-covered 3-conductor cable (3rd wire ground), a male 3-prong plug, and a female adapter for 2-slot receptacles or plugs.

For further information write to Maginniss Power Tool Co., 154 Distl Ave., Mansfield, Ohio, or use the Request Card at page 18. Circle No. 81.

### Generating plants

■ Onan's electric generating plants are featured in a catalog. Laid out in two-page spreads, each series of the plants—1 and 2-cylinder air-cooled models, and 4, 6, and 8-cylinder water-cooled and air-cooled diesel models—are described in detail. With each spread is a model-selection guide, lists of optional accessories, and specifications.

To obtain the catalog write to D. W. Onan & Sons Inc., University Ave. S. E., Minneapolis 14, Minn., or use the Request Card at page 18. Circle No. 137.

### Prestressing units

■ Freyssinet prestressing units for prestressed-concrete construction are detailed in a catalog from Intercontinental Equipment Co. The units, available in five sizes, are delivered in 5-foot-diameter coils. The catalog points out that the ultimate strengths for the units range from 15,000 to 135,000 pounds. The step-by-step construction procedure is detailed. Information is given on prefabricated prestressing units, anchorages for

small units, materials standards, and man-hour requirements.

To obtain the catalog write to Intercontinental Equipment Co., Inc., 120 Broadway, New York 5, N. Y., or use the Request Card at page 18. Circle No. 45.

### Small-size ditcher

■ The Barber-Greene Model 702 ditcher is detailed in a brochure from the company. According to a listing, the many uses of the ditcher include

cutting trenches for cable, pipe, and gas and water lines. Job photos point out that the ditcher achieves a maximum depth and width of 40 inches and 5 inches, respectively. Other photos show that the Model 702 can travel short distances on its own power, or for longer distances may be towed behind a truck or auto.

To obtain Brochure DM 5606 write to the Barber-Greene Co., 400 N. Highland Ave., Aurora, Ill., or use the Request Card at page 18. Circle No. 30.



2 Self-loading "D's"

## handle 30,000-yd. subdivision job

### grade and spread topsoil for 300 new homes

Working two 138 hp D Tournapulls as self-loaders, E. R. Fenwick of Matawan, N.J., was able to move 30,000 yds. of red gravelly clay in less than 3 months at the new Ocean Manor Heights home project of Middletown, N.J.

The construction firm of Sommer Brothers, Iselin, N.J. is building 300 homes in this big development project. The real estate firm had Fenwick's Tournapulls grade the area, cleaning up and spreading topsoil around nearby completed homes.

### Operate easily between houses

Working in areas where deep ruts, caused by previous work traffic, criss-crossed the ground, the two Tournapulls made fast, sharp turns between nearly-completed houses. Ability to turn at a 90° angle enabled "D's" to round the sharpest corners easily for accurate "on-a-dime" spot grading.

Footing was poor, for the work was done when working surfaces were wet and slippery with rain. Tournapulls maintained production schedules in spite of bad weather. On wet ground, Tournapull's power-transfer differential automatically transferred traction to the wheel on firmest footing.

The "D's" low-pressure tires proved an advantage in working land where considerable new street paving had been done, too. Tournapulls crossed and recrossed these streets many times each day without damage to tires, new blacktop or concrete.

### Best for narrow spaces

"You just can't beat Tournapulls for getting in and out of those hard-to-get-at places," commented owner Everett Fenwick. "They're fine for cleaning up an area after houses are up. 'D's' are economical to operate, too. I have 3 'C's' in addition to my 2 'D's'," he continued. "The combination is tops for any earthmoving project."

Fenwick has worked his rigs extensively through New Jersey. They were used on the Garden State Parkway project, and to grade semi-frozen ground for a new Esso Standard Oil Company Plant during off-season winter months.

Lack of good haul roads made little difference in the operation of E. R. Fenwick's D Tournapulls on the Ocean Manor housing project. Big, low-pressure tires carried the "D's" over raw, rutted earth, crossed new paving without damage to slab.

Maneuverability of "D's" saved time, cut down length of haul routes. Tournapulls were able to work close to buildings... turn sharply between partly-completed houses... spread topsoil accurately on lots.



Rains turned home site into quagmire on some days. But Fenwick's self-loading "D's" operated at near dry weather efficiency. Big deep-treaded tires gripped slippery surfaces, power-transfer differential shifted traction to drive wheel on firmest footing. King-pin steer "walked" it out of ruts.



### There's a Tournapull for your job

Whatever type of earthmoving work you do, there's a size Tournapull for your job. The 7½-yd. "D" combines profit-making capacity with speed and maneuverability. Larger "C" and "B" types are designed for production loading and hauling on heavy construction jobs.

Ask your LeTourneau-Westinghouse Distributor to recommend the right size and type of interchangeable Tournapull equipment for your work. His file of owner-verified facts will show just what Tournapulls can do for you.

Tournapull—Trademark Reg. U.S. Pat. Off. DP-1005-B-b



**LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS**  
A Subsidiary of Westinghouse Air Brake Company

ARBA



See you at the ROAD SHOW • Chicago • January 28-February 2, 1957

For more facts, use Reader-Reply Card opposite page 18 and circle No. 280

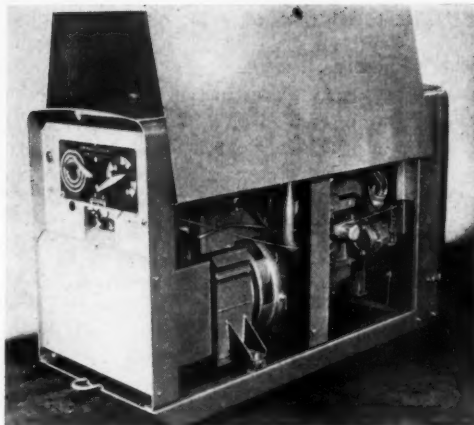
## New engine-driven welder in 300 and 400-amp units

■ A new engine-driven welder, with battery start and direct coupling between engine and generator, has been announced by General Electric.

Available in 300 and 400-amp models, the new welder includes reversing switch, battery start, and side panels as standard equipment. Built for heavy-duty service, the new welder is constructed of extra-heavy steel and has no projecting generator or controls that could be damaged in on-the-job operation.

Both 2 and 4-wheel trailers are available to meet varying requirements. The 2-wheel trailer features a small, retractable 12-inch-diameter wheel on the tow-bar.

The new 300-amp engine-driven welder announced by General Electric.



Maintenance on the new welder has been considerably simplified, according to company engineers. Constant-pressure brush springs requires no

adjustment and a sealed bearing on the generator eliminates relubrication. An exciter is not required, thus eliminating extra maintenance.

Gasoline-driven models are equipped with Hercules JX4 engines, rated 54 horsepower at 2,150 rpm.

Both the 300 and 400-amp models have a duty cycle of 60 per cent, rated temperature rise of 50 C, and open-circuit voltage of 80, and operate at a maximum rpm of 2,150.

The 300-amp unit, designated 30AG, has a welding range of 60 to 375 amp, and electrode capacity of 3/32 to 5/16. The 40AG, rated at 400 amp, has an operating range of 80 to 500 amp, and electrode capacity of 1/8 to 3/8.

For further information write to Welding Dept., General Electric Co., Schenectady 5, N. Y., or use the Request Card at page 18. Circle No. 104.

## Firm markets two new expansion materials

■ A new expansion-joint material that is said to provide unusually good bond to concrete, steel, and masonry surfaces has been produced by A. C. Horn Co., Inc., a subsidiary of Sun Chemical Corp.

According to the manufacturer, this extremely durable material makes virtually permanent joints possible, and insures a lasting seal against the entry of water. It also has excellent squeeze and stretch characteristics, which minimize defects frequently caused by expansion and contraction due to temperature changes.

Two types of material are now being distributed under the trade names Hornex 56 and Hornflex. Both types are recommended for use in the construction or maintenance of bridges, buildings, and highways.

Hornex 56 is based on a latex-type elastimer, with strands of jute rope as filler, and is reported to solve most expansion-joint problems. Hornflex is formulated with thiokol and jute filler, and is said to be preferable where special adhesion problems exist, or where excessive expansion and contraction can be anticipated.

For further information write to A. C. Horn Co., Inc., subsidiary of Sun Chemical Corp., 10-10 44th Ave., Long Island City 1, N. Y., or use the Request Card at page 18. Circle No. 110.

## Chain saw

■ A one-man operated chain saw designed for land-clearing contractors is described in a bulletin from Luther Corp. Specifications for the Indian Model 351-D saw state that it operates on a 3-hp engine. Bar sizes are 16, 20, and 24 inches. A cross-section view of the saw illustrates the design and construction features.

To obtain Form No. 55-1 write to Luther Corp., Warsaw, Ind., or use the Request Card at page 18. Circle No. 50.

## Armco sales appointment

Armco Drainage & Metal Products, Inc., has appointed Thomas H. Bell, Jr., to the newly-created position of assistant to the manager of welded pipe sales. He had been a salesman for the firm since 1954.

**One BUTLER Set-up Feeds 3 Hungry 34E Dual Drum Pavers**

*Job Facts:*  
In a 10 hour day the three 34E dual drum pavers laid 2754 feet of pavement. Hourly average 261 feet.

BUTLER has since developed equipment for even faster batching in the one man operated O-1-O Roadbuilders Plant. But this big job proves that even yesterday's equipment meets today's demand — IF IT'S built by BUTLER.

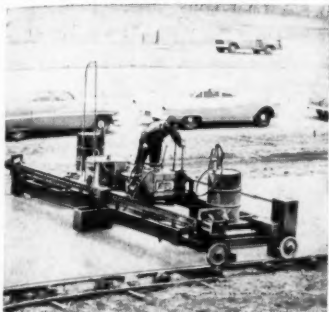
**CONTRACTORS:**  
M. Hoeffken Co. and  
Hoeffken Bros. Inc.  
Bellefonte, Illinois

**Butler Bin Company**  
Waukesha, Wisconsin

For more facts, use Reader-Reply Card opposite page 18 and circle No. 281

## New spray curing rig gives uniform coverage

■ A new automatic spray curing machine said to provide uniform coverage of concrete in one pass is announced by General Road Machines, Inc.



The new machine travels along the form line behind the finisher. Capable of spraying wax or resin-base materials as well as white-pigmented curing compounds, it has a single track-mounted spray head which passes transversely across the surface of the plastic concrete. The spray head, driven by a hydraulic motor through V-belts and a roller chain, travels the full width of the machine. Automatic traversing cycles can be set from 1 to 10 per minute.

Powered by a 12-hp, 2-cylinder air-cooled engine driving through oversized transmissions, the spray machine is capable of traction speeds from 5½ to 30 fpm. Transmissions provide three speeds forward and three speeds reverse, with instant reverse under load. According to the manufacturer, the new machine is adaptable to meet all normal spray curing specification requirements because of its wide range of traction and spray head cycle speeds.

This automatic spray curing machine is available with adjustable end frames, in standard widths of 10 to 15 and 20 to 25 feet. Other widths are available upon request. Ball and roller bearings are used throughout and steering clutches are standard. Single or double-flanged, or rubber-faced, track wheels are available in sets or in combinations.

Hardened stainless steel spray nozzles, fully protected by windshields, are said to assure uniform spray patterns and coverage, even in high winds. Curing compound is pumped directly from 55-gallon shipping drums. Pump delivery exceeds spray nozzle requirements and bypassed material is recirculated in drums.

Mechanical brooming, reciprocating belt, and burlap drag attachments are also offered.

For further information write to General Road Machines, Inc., Niles, Ohio, or use the Request Card at page 18. Circle No. 83.

## C. I. T. Corp appoints three field representatives

Three representatives have been named to handle installment financing of equipment for C. I. T. Corp., New York, N. Y. John F. Kane will represent the firm in Alabama, Jim L. Gisi will handle Georgia operations, and Harry L. Gay will represent the firm in South Carolina.

USING A SEAMAN-GUNNISON DUO-FACTOR in combination with a pneumatic-tire roller, a contractor at Mitchell Field Airport, Milwaukee, Wis., was able to complete practically all of his compacting operations in one pass. The Duo-Factor is being pulled by an International Model 300 utility tractor. The Seaman-Gunnison rig mounts both steel rolls and rubber tires. By using both, a higher density is possible than with either type alone. For more information circle No. 9 on the Request Card at page 18, or write to the Seaman-Gunnison Corp., 2763 S. 27th St., Milwaukee, Wis.



## Owners everywhere report:

# "4-in-1 Skid-Shovel beats a fleet of limited-duty rigs...outearns 'em all!"



"Clamshell cuts out hand labor"—Boh Brothers Construction Co., New Orleans, La. "If ever one machine could 'do it all,' our International Drott TD-9 Four-In-One Skid-Shovel is it," states Sam Venus, for Boh Brothers Construction Co., New Orleans, La. "Its clamshell action, for example, cuts out hand labor. We produce 150-175 5-yd. truck loads per 9 hrs." Watch the clam "surround" loose stuff—heap itself in one fast gulp!



"Loads 'high ones' others can't"—Mike Ferrantino, Dearborn, Mich. Mike Ferrantino, Dearborn, Mich., using his TD-9 Four-In-One, averaged loading 26 5-yd. trucks per hr., on a housing project. "I can load 'em from any angle, high tandems and all, with the high-reaching, bottom-dumping clamshell," he says. "My Four-In-One does so many jobs others can't do—even cleans itself of damp clay, dumping as a clamshell!"



"Moves material where others quit"—Consolidated Construction Co., Bayside, Va. "Our International-Drott TD-9 Four-In-One will move material where other units quit," declares Consolidated Construction Co., Bayside, Va. "It's a multi-purpose rig, has high reach, and will out-load anything in its size class." Here they're getting accurate "carry-type scraper" action on a housing project, with Four-In-One in Bullclam position!



"Beats the others in job variety"—Leon Sumler, Memphis, Tenn. "With it, I can do a far wider variety of jobs than the others," reports Leon Sumler, Memphis, Tenn.—of his International-Drott TD-9 Four-In-One, shown tearing up old filling station slab and footings to load out. "The clamshell speeds the job," he adds, "and Drott bucket roll-back makes it possible to keep heaped loads. It's the one-tractor-man's ideal rig!"



Prove versatility, unlimited—with the International-Drott 4-in-1 as Skid-Shovel, clamshell, Bullclam, and bulldozer. Prove you get 4 big-capacity material-moving rigs in one sensibly-priced unit! Try other Drott exclusives, like pry-action break-out and shock-swallowing Hydro-Spring. Ask your International Drott distributor for a 4-in-1 demonstration!



See you at the ROAD SHOW  
CHICAGO  
Jan. 28-Feb. 2, 1957

International Harvester Company, Chicago 1, Illinois  
Drott Manufacturing Corp., Milwaukee 15, Wis.

# INTERNATIONAL DROTT

For more facts, use Reader-Reply Card opposite page 18 and circle No. 282

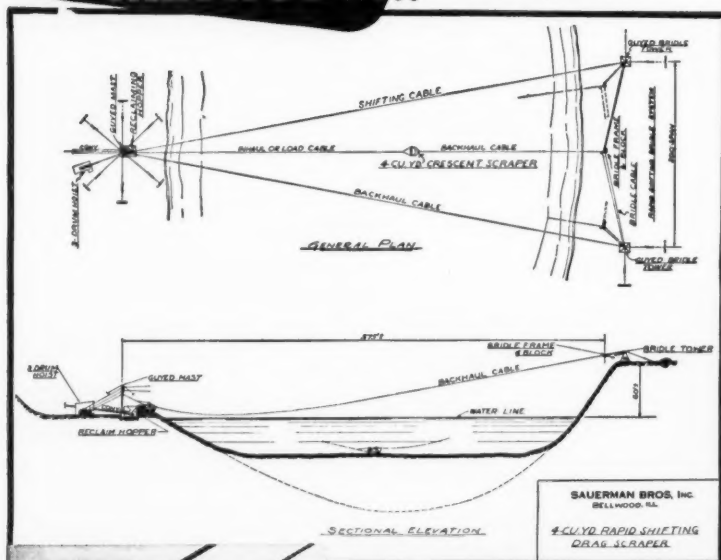


The large dome, with a post-tensioned concrete beam around the perimeter and containing 926 yards of concrete, stands completed as excavation of the structure gets under way.

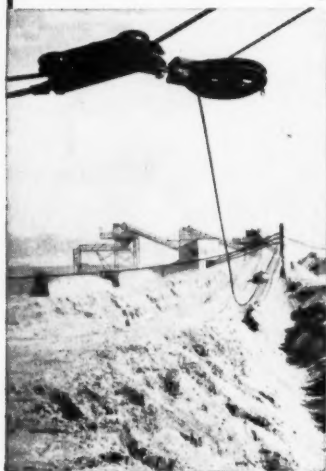
# Dome is built on ground, then earth is excavator m

## the SAUERMAN METHOD.....

**Scraper Machines  
Engineered to  
Your Operation**



Above drawing was prepared for a specific drag scraper installation and does not represent maximum spans.



View shows rapid shifting bridle frame and all operating cables. Crescent may be seen in background conveying load to reclaiming hopper just in front of mast.

Contact Sauerman's engineering department for specific recommendations and information. No obligation.

Ask for Catalog A, Drag Scrapers—24 pages of job photos and specifications. Request Field Reports showing your material being handled by the low cost Sauerman Method.

The Sauerman Method works equally well over widely differing areas and span limits... on hills, swampy ground or underwater... handles any material a dragline can dig.

Every scraper machine is powered by a Sauerman Roller Bearing Hoist, especially designed to withstand sudden shocks and changes in speed.

When a rapid shifter is used, a third hoist drum is added to shift the bridle frame. The rapid-shifting bridle system (upper right of drawing) permits frequent shifting of the scraper's line of operation in non-caving material, shallow excavations or overburden.

Operating costs are lower—basically, it is cheaper to drag material than it is to lift and transport it. You eliminate the power costs of moving heavy machinery about the area. You pay only for pay loads—not dead weight. When expendable parts—sheaves, clutch or brake linings—are replaced, the machine is restored to practically new condition.

Sauerman can help you select the method of materials handling most profitable for your job—a system that will give you the lowest cost per cu. yd. handled.

# SAUERMAN BROS. INC.

616 S. 28th AVE. BELLWOOD, ILL.

Crescent Scrapers • Slackline and Tautline Cableways • Durolite Blocks  
For more facts, use Reader-Reply Card opposite page 18 and circle No. 283

In a reversal of the usual building procedure, the contractor for the Albuquerque, N. Mex., Civic Auditorium built the 1,400-ton, 217-foot-diameter reinforced-concrete dome on the ground, then excavated dirt from the area inside the auditorium.

In sequence, the steps in this job were: digging a perimeter trench and throwing excavated material under the location of the proposed dome; building the 22 footings and pilasters that support the dome; backfilling footings and pilasters; hauling dirt in to support the dome until the pour developed design strength; and exca-

vating dirt from under the completed dome after a tension band had been wrapped around it to induce post-tensioning.

This method was chosen by the architects, Ferguson, Stevens, & Associates, Albuquerque, N. Mex., since it was most economical and the speed of construction was not a crucial factor on the job. About 225,000 cubic yards of material had to be excavated for the building on the high mesa overlooking the city, where the structure will serve as an all-purpose auditorium for conventions, exhibit-type shows, concerts, and municipal func-



## Your new Pump Manual is ready

Prepared for pump users and specification writers, the new Contractors Pump Manual gives the recently increased performance standards for A.G.C. Rated pumps, and 22 additional pages of helpful information on the selection and operation of contractors pumps.

If you do not yet have a copy, send in your request today. It will bring you up-to-date with the advances of an industry which is dedicated to progressive improvement in its standards and practices.



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For more facts, use Reader-Reply Card opposite page 18 and circle No. 284

CONTRACTORS AND ENGINEERS

# d, water municipal auditorium

by RAY DAY

An Allis-Chalmers HD-5-G tractor with a Tractomotive shovel loads dump trucks with material that is located just under the dome. This machine carried excavation from the apex of the dome to beam level.



tions. Provision has been made for the addition of 300 seats to the 6,200 seats in the new building.

Before deciding on a method of construction, the architects studied various alternates, since some modification of conventional procedures was required at this site. Lift-Slab construction was even considered, but this was abandoned after officials of the U. S. Lift-Slab Corp., Austin, Texas, advised that no single control console would be able to handle such a lift. If the method were selected, several consoles and jacking systems would have had to be used.

Despite the handicap of the dirt-handling operation under the method chosen, Lembke-Clough-King, Inc., Albuquerque, is completing the \$1,-100,000 structure at a saving of about \$50,000 on what it would have cost the city if the dome had been built in the conventional manner on level ground and shoring used.

## Pilasters formed

A Link-Belt Speeder dragline started the work by excavating the 12-foot-wide trench around the perimeter of the structure, casting excavation from the trench under the

location of the dome where natural dirt lay within 6 feet of the dome's spring line. The dragline and a small backhoe were used to excavate for the 10x14-foot reinforced-concrete footings, which go 27 inches deep. The earth under the footings is excellent bearing material—dry, well drained sand, gravel, and small boulders.

The 22 reinforced-concrete pilasters 18x48 inches at the bottom and 18x72 inches at the top, were built atop the footings. The forms for the pilasters, made with Masonite facing nailed to plywood sheets were held on line by Burke form hardware.

The pilasters were poured with truck-mixed concrete from the commercial plant of Albuquerque Gravel Products Co. A Link-Belt Speeder crane made the transfer in a Gar-Bro 1-yard bucket. As soon as the pilasters had been completed and stripped, they were backfilled with dirt previously excavated. Then extra dirt to support the dome pour was hauled in by three Cat and scraper combinations. This dirt, pre-watered, was heavily rolled with sheepsfoot and pneumatic equipment, so that it developed a high density—enough to

(Continued on next page)

## NOW! GET BETTER POURED WALLS FOR LESS COST WITH ROCKFORM SYSTEMS

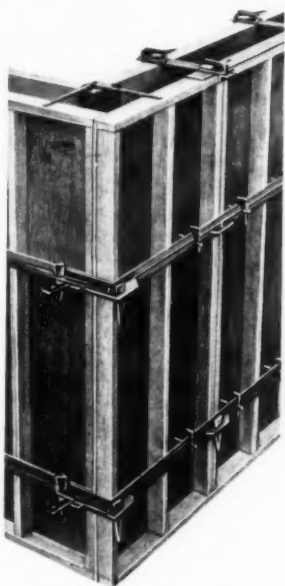
**ROCKFORM SYSTEMS ARE THE ONLY** concrete forming system that guarantees all walers, tie rods, tie pins and clamps. These items are all re-usable and are replaced without charge whenever necessary.

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340,000 BTU's  
at 2400 cu. ft. of  
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## "Packaged Weather" Speeds Operations

Quick starts for heavy equipment on cold mornings . . . protection against freezing of concrete while curing . . . comfort for men working in semi-enclosed areas. These are but a few of the production benefits provided by the Clayton Summaire "300" Portable Heater in keeping jobs on schedule.

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Series "300" Clayton Summaire Heaters are made in three models; electric or gasoline engine drive; with or without automatic temperature control for confined areas. Capacities range from 320,000 to 375,000 BTU's per hour, with up to 2700 cu. ft. of heated air delivered per minute. Temperature rise as high as 170°F. Uses less than 2½ gals. fuel oil or kerosene per hour; runs 10-11 hours without refueling. Enclosed combustion chamber insures odorless, safe operation. Ask for demonstration.

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 285

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 286



The heavier bank of material from beam level to floor grade is excavated by a Link-Belt Speeder 3/4-yard shovel. It works against a 20-foot bank, loading trucks spotted at either side.

(Continued from preceding page)

support the roof pour.

Since the underside of the upper part of the dome was formed directly in contact with dirt, precise fine-grading was done by a motor grader and a small labor crew. An Essick steel-wheel roller did the final smoothing job, working the dirt down to close tolerance. This done, the beam forms and the plywood and masonite forming for the exposed portion of the underside of the dome were installed. This forming was required so that the finished concrete would have a pleasing appearance.

After the plywood sheets had been pre-cut to a pattern and staked to the compacted ground, steelworkers placed the radial and longitudinal re-

inforcing, using planking where necessary to protect the fine-graded earth. Altogether a total of 145 tons of reinforcing, covering both the dome and its perimeter beam, went into the roof. Before concrete was placed, the dome forms were given a coat of form oil.

#### Concrete placed in stages

The dome, varying from 12 inches thick at the perimeter to 5 inches at the apex of the rise, has an underside with an inside radius of 288 feet and rising 23 feet from the spring line to the crown. The perimeter beam, heavily reinforced with bars up to No. 11 to counteract the post-tensioning forces, is 8 feet x 24 inches. It extends around the perimeter of the roof and ties in monolithically with the reinforced-concrete pilasters.

Concrete placement for the dome was handled in four stages in four successive days. On the first day, 324 cubic yards of concrete was placed in the beam and the lower part of the dome. The 275-cubic-yard pour the next day was followed by pours of diminishing yardage, the fourth pour completing the dome.

The mix for the 926 cubic yards required for the dome, designed for a compressive strength of 3,750 psi at 28 days, consisted of 6 sacks of cement per cubic yard of 1 1/2-inch-minus aggregate. The relatively large size aggregate was used to keep shrinkage to a minimum.

The Albuquerque Gravel Products Co. truck mixers supplying concrete for the pilasters were used to bring concrete to the dome. On the lower section, which required the greatest amount of concrete, the Challenge truck mixers were able to reach many parts of the pour. A Link-Belt Speeder crane handling a Gar-Bro 1-yard bucket with its 50-foot boom, was also used for concrete placement. As the dome rose, a rented P&H crane equipped with a 110-foot boom was pressed into service to handle the transfer buckets.

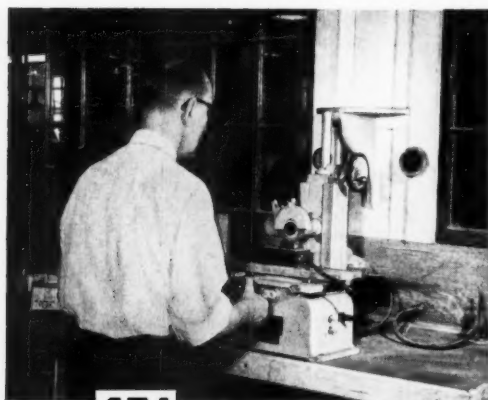
Mall and Viber vibrators, operated carefully where earth supported concrete, consolidated the concrete. A wood float surface made it possible for a good bond to be built up for the asphalt and rock roof that lies on top of the concrete, which was cured with Sealtext asphalt membrane solution.

Post-tensioning was applied to the concrete beam at the perimeter of the dome to restrain expansion and contraction movements as much as possible, and to provide a stable concrete shell with low working stresses under all temperatures.

The beam tensioning band consisted of 860 turns of No. 8 high-tensile wire, post-tensioned to 145,000 psi. The breaking tension of the wire is about 180,000 psi and the final working stress after construction losses is expected to be about 110,000 psi. The furnishing and installation of this post-tension band was subcontracted to Jack Crom, Gainesville, Fla. The band was anchored about every three turns of wrapping and a 4-inch concrete cover was placed after the band was completed.



## Your Wickwire Rope Distributor and our die maker... ready to serve you



This die maker—one of the skilled technicians responsible for the quality of our rope wire—is with your Wickwire Distributor every time he makes a call.

True, he's physically in our plant, working to tolerances of 1/10,000 of an inch as he fashions the super-hard carbide dies used to produce every foot of rope wire. But, whenever your Wickwire Distributor makes his call, he has the full assurance that every wire in the product is exactly the size it should be and has a smooth, silky surface finish. This careful attention helps assure a rope which will perform successfully.

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4083

A PRODUCT OF THE COLORADO FUEL AND IRON CORPORATION

For more facts, use Reader-Reply Card opposite page 18 and circle No. 287



On the north side of the building, earth is shoved from under the building to a trap by an International TD-14-A tractor. A Pioneer feeder and 24-inch conveyor feed the surge bin which loads trucks hauling the dirt away.

#### Excavation follows

Of the 225,000 cubic-yard grading job involved in this project, some 93,000 yards had to be excavated from under the dome. This job, more like a stope-mining operation with the stope ceiling already in place, was done with the dirt taken out from under the dome in two lifts.

The upper lift, from beam level to the apex of the dome, was excavated on the south side by an Allis-Chalmers HD-5-G tractor and Tractomotive shovel that loads the material into dump trucks.

The lower lift, excavated from the north side, was handled by an International TD-14-A tractor with hydraulic dozer, which shoved the material down through a ramp under the beam to a gravity feed hopper. A Pioneer plate feeder under this hopper places the material on a 24-inch stacker conveyor that leads to a 30-yard surge bin which loads trucks hauling to a dumping ground.

The heavier bank of material from beam level to floor grade was handled by a Link-Belt Speeder ¾-yard shovel. This is a bail-and-load operation, trucks shuttling in and out on a double-spotting access arrangement, while the shovel worked against the 20-foot-high bank.

#### Construction

As soon as grading around the site is finished, the 20,000-square-foot lobby, a large storage and dressing room, a 500-seat meeting room, miscellaneous space, and a parking area for 1,000 automobiles will be constructed. The 217-foot diameter building will be enclosed by concrete-block walls that rise between the pilasters to a point 4 feet below the beam. This space will be enclosed by glass so that light will be admitted into the auditorium. The ceiling will be suspended from the dome and will cover about 80 per cent of the dome area, leaving part of the concrete exposed. Air conditioning will be installed before the scheduled completion date of December 31.

Robert McElveny, general superintendent for Lembke-Clough-King, is supervising field operations, and coordinating the work of several subcontractors handling plumbing, electrical, painting, and other specialized work.

THE END

#### Self-propelled roller boasts versatility

■ The Poweroll, a new ½-ton roller complete with 3-hp, 4-cycle, air-cooled engine, has been added to the line of products manufactured by Cleveland Formgrader Co.

The new roller is made with a 3/16-inch steel-plate roller drum for general contractor use in compacting roadways, and in a 10-gage drum thickness for lawn or roadside maintenance and landscaping. The Poweroll rolls a 35-inch-wide path and is equipped with a tractor-type seat for operator comfort.

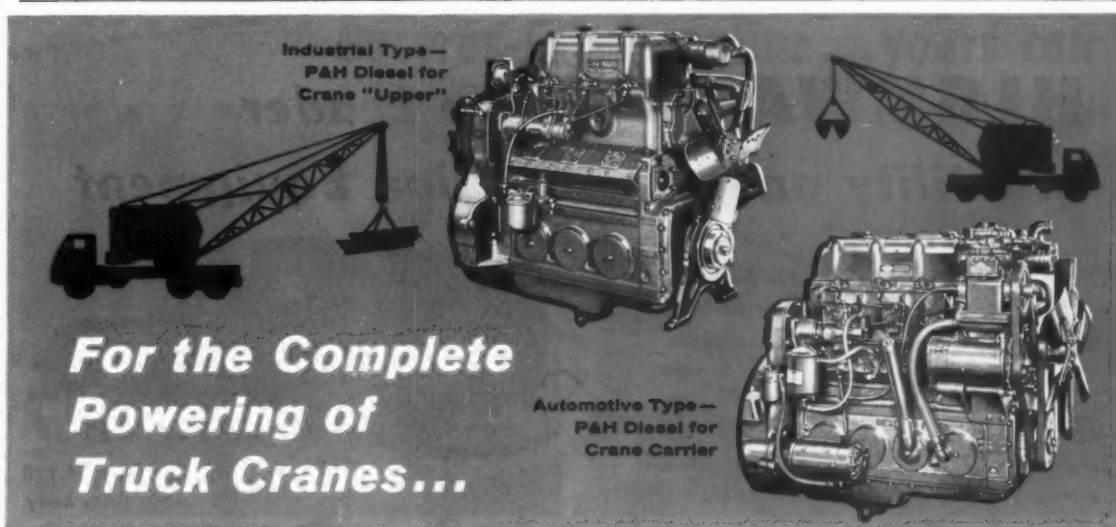
The new roller reportedly handles easily through its gear-type steering mechanism, and incorporates dust-proof ball bearings throughout. It

utilizes a chain drive with forward, neutral, and reverse transmission. The roller is easy to transport and is rugged in construction, weighing only 500 pounds when empty and approximately 1,260 pounds water-filled. It is available with or without a water tank.

For further information write to Cleveland Formgrader Co., R. D. #1, Mills Road, Avon, Ohio, or use the Request Card at page 18. Circle No. 79.

#### Leschen names assistant to general sales manager

Karl F. Ewerhardt has been appointed to the newly-created position of assistant general sales manager of the Leschen Wire Rope Division of H. K. Porter Co., Inc., St. Louis, Mo.



### IT PAYS TO STANDARDIZE ON P&H DIESELS

In the past Diesels have never been welcomed for the complete powering of truck cranes. Slow starting—stalling while idling—insufficient acceleration have proved handicaps to their acceptance, especially for powering of the carrier.

Now these limitations to the use of Diesels for complete powering have been totally overcome through new P&H product developments. Highly responsive P&H Engines—Series C-18 accelerate and decelerate as fast—idle as well without fouling or clogging—start in normal temperatures as quickly as a gas engine.

When you standardize on 2-Cycle P&H Diesels for complete powering, you get the right Diesel power for the right job. An Automotive Type-P&H Engine in the crane carrier takes you wherever a truck can go—gets you between jobs fast. An Industrial Type-P&H Engine in the crane "upper" helps you handle any crane assignment with plenty of slow, sure, steady power for maximum control, safety and production.

For the first time you can burn fewer gallons of low-cost Diesel fuel in both truck crane engines. Use of 2 similar type P&H Engines also results in easier understanding and better maintenance of both engines by one man. Savings are substantial, too, on parts inventorying and repair costs. All wearing parts are interchangeable between P&H Engines.

If you want money making and money saving power, it will pay you to investigate the complete powering of your truck cranes with P&H Diesels.

For Modern Engineering Look to

# HARNISCHFEGER

P&H DIESEL ENGINE DIVISION  
Crystal Lake, Illinois

Please send me additional information on P&H Diesel Engines for complete powering of truck cranes.

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#### P&H Product Development Features In New Series C-18 P&H Diesels

**For Quick Starts**—automatic retarding of the fuel injection until P&H Engine speeds reach 500 r.p.m.

**For Good Idling**—use of P&H developed injector tips with a single, large hole to prevent fouling or clogging.

**For Instant Response**—new, simplified P&H fuel system providing fast acceleration and deceleration.

**For Dependable Power**—new P&H Power Assembly, new cooling system, new dual porting of cylinders for better combustion—more power.

**For Less Down-Time**—simplicity of P&H Diesel design, interchangeability of all wearing parts and the P&H "Unitized" Power Assembly.

P&H Diesel Engines are available in 2, 3, 4, and 6 Cylinder Models for the complete powering of truck cranes from 15 to 35 tons in size.

## New version of saw has 36-hp engine

■ The 1956 version of the Target 360 automatic, self-propelled concrete saw features a Wisconsin 36-hp, air-cooled engine and a collector-type pre-cleaner in addition to the standard oil-bath air cleaner. A rotating flywheel screen deflects dust and sludge away from the air intake screen.

The cutting depth of the blade is hydraulically controlled for precision operation and can be changed while the rig is in motion. A visual dial indicates the depth for which the blade has been set. Cutting speeds of from 1 to 25 fpm are finger-tip selected.

According to the manufacturer, the drive-engaging mechanism is sensi-

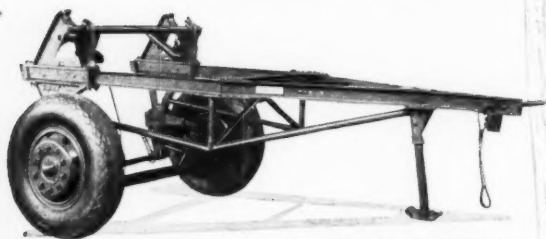


The Target 360 concrete saw has a Wisconsin engine with several new features to keep it clean and free from trouble.

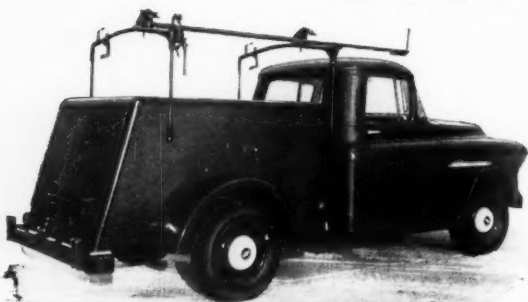
# HIGHWAY Still The Leader In Utility and Construction Equipment

At Highway, utility equipment is designed, engineered and built for safe, dependable performance . . . specifically for the job required . . . and for long, trouble-free service life at low operating cost. A strict program of quality control has earned Highway the reputation as the leader in every detail of advanced utility equipment production.

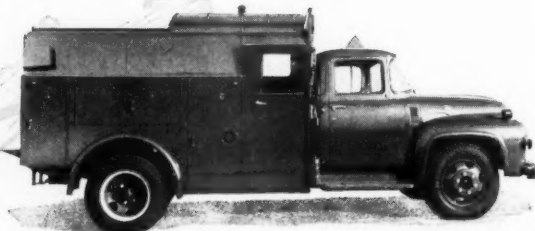
What are your needs or requirements in line construction and maintenance equipment? Let us show you how Highway's design, engineering and extensive production facilities can solve your problems.



Highway PWD-2 Cable Reel Trailer



Highway IU-76 Installer's Unit



Highway MW-128 Utility Truck Body



Highway heavy-duty HC Earth-Boring Machine

Highway PWD-2 Cable Reel Trailer is designed for quick, easy loading and transport of heavy cable reels up to 48" wide. Like other Highway utility trailers, it handles its load safely and steadily, even at high speeds on the road.

Highway MW-128 Utility Truck Body carries a full crew to the job with all necessary materials and equipment, on a standard truck chassis. Highway builds a full line of utility bodies for general and special service.

Highway IU-76 Installer's Unit is a specialized body for mounting on a half-ton truck. Scientifically arranged equipment compartments and tool carriers at sides and rear put all needed tools and materials within arm's reach.

Highway heavy-duty HC Earth-Boring Machine digs holes 9 to 36 inches in diameter, up to 10 feet deep in any soil. Portable, tractor-mounted, and self-powered models are also available.

## HIGHWAY TRAILER CO.

HEADQUARTERS • EDGERTON, WISCONSIN

### MANUFACTURERS OF

Utility Truck Bodies • Earth-Boring Machines • Pole and Cable Reel Trailers • Winches • Power Take-Offs • Service Accessories • Commercial Trailers • Trailerized Tanks • Dry Bulk Haulers

SALES AND SERVICE IN PRINCIPAL CITIES

For more facts, use Reader-Reply Card opposite page 18 and circle No. 289

tive enough to allow instant starts and stops. An outrigger-type rear axle and six wheels aid straight cutting on uneven surfaces.

For further information write to the Robert G. Evans Co., 7204 Wyandotte, Kansas City 14, Mo., or use the Request Card at page 18. Circle No. 21.

## Four-wheel-drive units added to truck line

■ Four-wheel-drive trucks in the ½ through 1-ton weight range have been added to the GMC Truck & Coach Division's line. Six basic models, including pickups and panels are available.

The trucks are offered with either 130-hp, 6-cylinder gasoline engines or 180-hp V-8's, and with 4-speed manual or Hydra-Matic transmissions. They can be equipped with power takeoff. The change between 2 and 4-wheel drive is made by shifting a single lever.

The 4-wheel-drive shift lever, separate from the conventional gear shift, has both a high and a low position. The low is for worst possible driving conditions; the high for regular cross-country travel.

Gross vehicle weights of the Model 100, 150, and 250 units range from 5,000 to 8,800 pounds. Rear axles weigh from 3,300 to 7,200 pounds; front axles from 2,200 to 3,500 pounds. The transfer case is mounted in rubber to absorb shock and reduce body strain. It channels power by two separate drive shafts to the front and rear axles when all wheels are driving. It has a minimum ground clearance of 14 inches.

For further information write to GMC Truck & Coach Division, General Motors Corp., 660 South Blvd. E., Pontiac 11, Mich., or use the Request Card at page 18. Circle No. 16.

## New material mover

■ The Rex Railporter, consisting of a powered unit with hopper that runs on a single rail, is described in a catalog from the Chain Belt Co. According to the catalog, the entirely self-propelled unit travels at a rate of 300 fpm carrying 26 cubic feet of materials. The monorail may be set up over any terrain. The parts of the unit and the rail system are detailed.

To obtain Bulletin 56-47 write to the Chain Belt Co., 4701 W. Greenfield Ave., Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 139.

## Sprocket-installing sets

■ Owatonna Tool's 50 and 100-ton sprocket-pulling and installing sets are detailed in a folder. The sprocket pullers are designed for Caterpillar and Allis-Chalmers crawler tractors, and for the International Harvester TD-24. Installation photos are included in each section of the folder devoted to those companies.

To obtain the folder write to Owatonna Tool Co., 381 N. Cedar St., Owatonna, Minn., or use the Request Card at page 18. Circle No. 138.

CONTRACTORS AND ENGINEERS



Granite-filled gabions are used to erect a protective wall along a river bank.

### Rock-filled baskets for waterway defense

■ River and sea gabions for building permanent flood-control embankments, sea walls, and other types of waterway defenses are offered by River & Sea Gabions, Inc., New York City, distributors in this country for the Italian manufacturer, Officine Maccaferri of Bologna.

These gabions are large baskets, made from specially-coated steel wire, which are filled with loose rock or stones at the site to form permanent and yet flexible control structures. Both river gabions, coated to resist corrosion by fresh water and recommended for river work, and sea gabions, which have been treated to resist the corrosive action of sea water, acids, and other strong corrosive elements, are offered.

Sizes range from  $6\frac{1}{2} \times 3\frac{1}{4} \times 1\frac{3}{8}$ -foot gabion, which has a capacity of about  $1\frac{1}{3}$  cubic yards, to a 13-foot 1-inch  $\times 3\frac{1}{4}$ -foot  $\times 3\frac{1}{4}$ -foot model, with capacity of more than 5 cubic yards. Four sizes of mesh and four gages of wire are available in river gabions, while two meshes and one gage are offered in the sea models.

According to the distributor, the gabions may be filled by front-end loaders, cranes, or other material-handling rigs. If an architectural effect is desired on a structure such as a sea wall, the outside layers of rock may be placed by hand.

The gabions are shipped flat and can be assembled easily by unskilled labor at the site. The distributor emphasizes that no grout or other binding material is used between the stone or rock, as the structures must maintain a certain amount of flexibility. Wired together, a string of gabions is said to present an effective defense for a variety of water-control projects. The gabions have been used with great success in flood-control work in Italy and other parts of Europe.

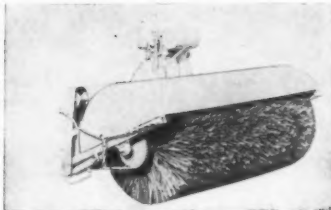
According to the company, these gabions present an economic advantage over concrete water-control structures in that the gabions may be filled with waste rock found at the site or nearby.

For further information write to River & Sea Gabions, Inc., 55 W. 42nd St., New York 36, N. Y., or use the Request Card that is bound in at page 18. Circle No. 73.

### Front-mounted sweeper fits most prime movers

■ A new front-mounted sweeper for use with most tractors, trucks, and similar prime movers is available from Little Giant Products, Inc. It is called the Model FM-C.

Driven by an 8-hp, air-cooled, independent gasoline engine, the brush rotates at a constant speed controlled by governor settings, and is entirely independent of the speed of the prime mover. The sweeper assembly can be



detached in a few minutes by removing one kingpin and disconnecting the hydraulic coupling.

The brush has a wear adjustment, angles 30 degrees right or left, and

tilts at either end. Ground pressure is adjusted by chain supports. The height of the FM-C sweeper is 51 inches, diameter of the brush is 31 inches, and brushes can be obtained in 6, 7, or 8-foot lengths. The standard brush is of tough, wear-resistant Palmyra fibre, and bristles are replaceable.

For further information write to Little Giant Products, Inc., 1530 N. Adams St., Peoria, Ill., or use the Request Card that is bound in at page 18. Circle No. 23.

**Bonus Quality**  
*saves you money*

## These jobs profited from a Bucyrus-Erie Dragline...yours can too!



**ST. LAWRENCE SEAWAY.** For larger, more demanding excavation projects like the Long Sault Canal on the Seaway, contractors prefer big-capacity machines like this Bucyrus-Erie 71-B with 3-yd. bucket.



**SAN FERNANDO VALLEY, CALIF.** This 54-B with 3-yd. bucket working on a Los Angeles River flood control project for the U. S. Corps of Engineers, demonstrates day after day the big output and dependability for which Bucyrus-Erie machines are well known.



**SELMER, TENN.** Bucyrus-Erie 15-B equipped with  $\frac{1}{2}$ -yd. bucket cleans out a  $\frac{1}{2}$ -mile drainage ditch on a Tennessee farm. You'll find all the essentials of profitable dragline service in Bucyrus-Erie because they are built for superlative service on jobs like yours!



**LITTLE ROCK, ARK.** Working in gumbo and hard clay, this 22-B with  $\frac{1}{4}$ -yd. bucket digs a V-type irrigation ditch for rice fields near Little Rock. Users find that Bucyrus-Erie Bonus Quality pays off in any type of digging.

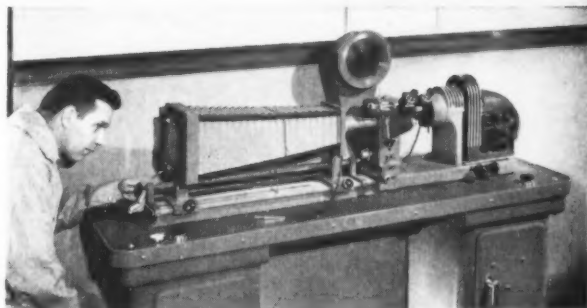
**W**HATEVER the job, it can profit from the extra working ability of a Bucyrus-Erie dragline. From the ground up, these machines are designed and built to put power to work moving dirt with maximum efficiency.

See your Bucyrus-Erie distributor soon and have him give you all the facts on draglines from  $\frac{3}{8}$ - to 4-cu. yd.

212E56C

**BUCYRUS  
ERIE**

SOUTH MILWAUKEE  
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**Bonus Quality**

This research technician is examining the grain structure of a piece of steel. All steel used by Bucyrus-Erie undergoes rigid tests to make sure it comes up to highest standards. This means machines that cost less to maintain and offer many years of extra service.

A device currently in use in Wyoming for making traffic counts may open the way to new methods of controlling traffic and making highways safe. One such unit, about the size of



As a vehicle passes on the road, it breaks the magnetic field set up by part of the device and this disturbance is noted in the reporting unit, foreground.

## Electronic device introduced for Wyoming traffic control

**Instantaneous and remote studies of traffic conditions possible; still in developmental stage, it may have many other uses**

a rural delivery mail box, is being used on U. S. 30 west of Cheyenne. Part of the equipment is a coil, buried under the asphalt surface of the roadway, which sets up a magnetic field. Vehicles passing along the road break the magnetic field, and a small high-frequency radio transmitter, located

in the small box installed at the side of the road, automatically opens and sends a signal to an automatic recorder in the Cheyenne office of the Wyoming State Highway Department.

According to Thurman Sherard, deputy state highway engineer, this is a new method of making a traffic

count, and it can be set to record the total amount of traffic each hour or the total amount of traffic using the road in a given time. This setup permits headquarters office personnel to study traffic at any time.

### Future possibilities

The new device, developed by John T. Roberts, chief radio engineer for the Wyoming State Highway Department, promises much for the future.

If, for instance, central control of traffic can be established, it would be possible to determine the intensity of traffic on portions or all of the state highway system and assign extra patrolmen to areas where traffic volumes are highest.

Another possibility, which is being seriously considered, is the use of radio-controlled traffic signs. These



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IN sheer lifting ability—size for size, around a full 360 degrees—this Harnischfeger Corporation 555A-TC has never been surpassed. Indeed, few truck cranes come close to this workhorse in versatility, safety features, maneuverability and on-the-job performance. 28 Timken® tapered roller bearings play a vital part in this outstanding record, in boom hoist drum, hoist and digging drum, swing shaft, front and rear axles.


The tapered design of Timken bearings, with full line contact between rollers and races, gives extra load-carrying capacity. And this same design lets Timken bearings take the tremendous radial and thrust loads in all combinations. To meet sudden

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Timken bearings are designed by geometrical law to have true rolling motion and manufactured to live up to their design. They practically eliminate friction, give long bearing life with less maintenance.

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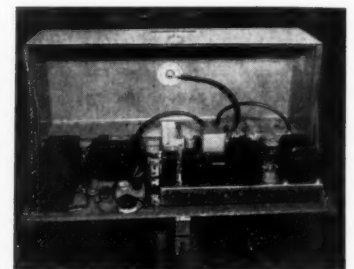


# TIMKEN

TAPERED ROLLER BEARINGS ROLL THE LOAD

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At the left end of the radio traffic reporter is the electro-matic amplifier that notes the disturbance caused by a passing car and relays the message to the transmitter. Both transmitter and power supply are at the right.

multi-sided signs would be correlated with the radio counters. When traffic becomes heavy, they can be turned on by radio impulse, calling for a reduced speed. Signs warning of icy roads, fog, and other hazardous road conditions might also be radio-controlled.

Wyoming officials emphasize that although the device is still in the developmental stage, a number of other state highway departments have shown interest in the system. If it can be perfected—and there are engineers who believe this to be feasible—Wyoming can take the credit for introducing the newest electronic tool that will not only make highways safe, but also influence the course of highway construction in the states.

THE END

### New book on geology

A new book from the Philosophical Library, "Geology and Ourselves", by F. H. Edmunds, emphasizes the importance of geology in everyday economic life. The varied nature of the economic problems that a geological surveyor must understand are discussed broadly.

Intended as a reference book for laymen, the text also treats the history of geology from its beginnings to the present day, geological maps and surveys, and the history of the earth. Chapters are devoted to geophysics and geochemistry, water supply, building materials, coal and coal mining, ores, and mineral oil and natural gas. A special chapter deals with geology for the amateur.

Priced at \$10, the book is available from the Philosophical Library, 15 E. 40th St., New York 16, N. Y.

CONTRACTORS AND ENGINEERS

## Avoid legal pitfalls

### Rejected compromise does not bind contractor

**THE PROBLEM:** A contract called for construction of 1,240 concrete-porch additions to dwellings in a housing project. When work was partially complete, dispute arose between the owner and the contractor concerning the sufficiency of performance. Work was suspended, and in the course of negotiations for a settlement of the dispute and the resumption of work, the contractor wrote the owner: "We herewith confirm our compromise offer to allow you \$2,500 to be credited against our present bill of \$19,430 for work completed." Work was not resumed, and the compromise was not accepted. The owner sued for damages for failure to complete the contract, and the contractor counter-claimed for the value of the work done and for damages, on the theory that the owner had wrongfully refused to permit completion. The owner did not offer any evidence to support a claim of damages resulting from defective performance of the contract on the porches constructed, other than the contractor's offer. Could that offer be considered as the contractor's admission of liability?

**THE ANSWER:** No. (Winfield Mutual Housing Corp. v. Middlesex Concrete Products & Excavating Corp., 120 Atl. 2d 655, decided by the Appellate Division of the New Jersey Superior Court.)

The court decided that the work had been done in substantial compliance with the contract, and that the contractor was thereby entitled to collect the contract price, less the cost of remedying defects. It was then up to the owner to prove what the cost would be. The offer to compromise did not amount to an admission that the owner had been damaged to the extent of \$2,500. It merely showed what the contractor was willing to pay to avoid litigation and to secure reinstatement of the contract on a mutually satisfactory basis.

The court's decision of the case in the contractor's favor rested somewhat upon proof that the last 54 of the 312 porches constructed strictly complied with contract requirements, an indication that the remainder would have complied had the contractor been allowed to proceed. "Ordinarily, the right to claim a breach of the whole contract depends not on whether the acts constituting the breach were departures from the contract terms, but on whether they were inconsistent with an intention to be further bound by its terms or upon whether the breach was such as to defeat the purpose of the contract."

### Builder's fee may include percentage of cost of extras

**THE PROBLEM:** A written construction contract specified that the contractor should receive a five per cent fee on the cost of construction. Was he entitled (1) to a percentage on the cost of extra materials and labor furnished under oral agreement between the parties, and (2) to a percentage on extra expense incurred because of increased labor and material costs due to market price rises?

**THE ANSWERS:** (1) Yes. (2) No. (Shanks v. Fisher, 130 N. E. 2d 231, decided by the Appellate Court of Indiana.)

The court also decided that a promise to pay a builder an extra sum for doing what he is already required to

do under an existing contract is not binding. But of course a promise to pay for additional labor or material is binding. In fact, probably any court would say that there is an implied promise to pay in such cases when there is not a special promise.

### Income tax is due on personal travel expenses

**THE PROBLEM:** A construction company's job superintendent was called away from his home town for stretches of a year or more, working on the jobs to which he was assigned. In his income-tax returns for two years, he deducted about \$4,000 for lodging, meals, and expense in going home weekends from a job that lasted more than two years. Was he entitled

### Edited by A. L. H. STREET Attorney-at-Law

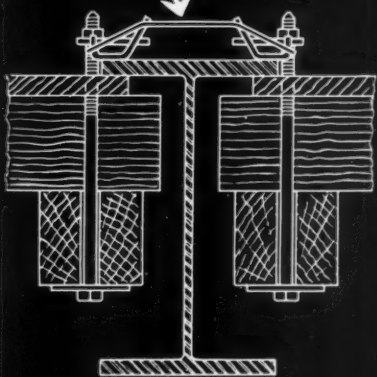
These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

to make the deductions?

**THE ANSWER:** No. (Ford v. Commissioner of Internal Revenue, 227 Fed. 2d 297, decided by the United States Court of Appeals, Fourth Circuit.)

The court reasoned: Expenditure for travel is not deductible unless incurred in the pursuit of a trade or

## Faster Adjustment from TOP of Deck



TOTAL SAFE LOAD ON BOTH COIL BOLTS IS 10,000 LBS., OR 5,000 LBS. PER BOLT

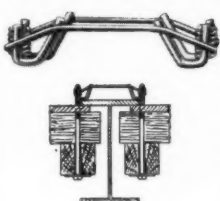
## WHEN HANGING FORMS WITH SUPERIOR PLATE HANGER FRAMES



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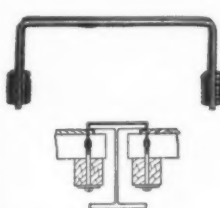
## FOUR OTHER SUPERIOR WAYS TO HANG FORMS FROM STEEL BEAMS AND GIRDERS ON BRIDGE SUPERSTRUCTURES

### STANDARD COIL HANGER FRAME



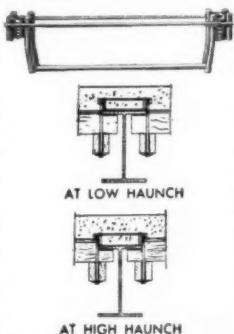
When hanging forms where specifications do not permit any hanger wire to be exposed after stripping, use Superior Standard Hanger Frames. Detail at left shows their use with double ledgers, 1/2" coil bolts, and flat washers. Total safe load on both bolts for Type 10M is 10,000 lbs., or 5,000 lbs. per bolt. For Type 6M, total safe load on both bolts is 6,000 lbs., or 3,000 lbs. per bolt.

### COIL BEAM SADDLE



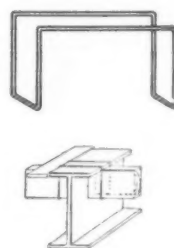
On jobs where hanger wires may be cut after stripping the forms, use Superior Coil Beam Saddles. The Coil Bolts allow for any variation in lumber and flange thickness and tightening the bolts pulls the forms tightly against the flanges. Forms are easily stripped. Safe load is 6,000 lbs. per saddle, or 3,000 lbs. for each 1/2" Coil Bolt. Coil Beam Saddles are also furnished for 3/4" and 1" bolts.

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## avoid legal pitfalls

business. Additional living expenses at the taxpayer's place of business if he maintains his home elsewhere for his own personal convenience, are not deductible.

### Lease on gravel pit is ruled extendable

**THE PROBLEM:** A gravel-pit lease for ten years specified that the lessee, "his heirs and assigns," could extend it from year to year at a \$150 annual rental until all gravel and sand was removed. (1) Was the lease void for indefiniteness? (2) Would the extension clause be invalid even if conditions had so changed that it was

inequitable that the purchaser of the land from the lessors be bound by it? (3) If the purchaser knew of the lease and of the extension provision was he bound by it?

**THE ANSWERS:** (1) No. (2) No. (3) Yes. (McMillan v. Malvern Gravel Co., 136 Fed. Supp. 567, decided by the United States District Court, Western District of Arkansas.)

The court referred to a decision by the Arkansas Supreme Court, upholding the validity of another sand and gravel pit lease, which provided: "This contract is to remain in full force and effect so long as the party of the second part continues to mine and remove sand and gravel from any pit or pits that are or may be located upon the above-described lands." (Mooney v. Gantt, 219 Ark. 485, 243

S. W. 2d 9, 10).

About the case under consideration, the federal court said that even if the purchaser of the land had not actually known of the extension provision in the lease, the fact that the lessee or his successor was in possession was enough to put the purchaser on notice as to the extent of the lessee's rights.

### Court defines negligence and breach of contract

**THE PROBLEM:** General construction and plumbing on a North Carolina school building were let under separate contracts. The general contractor sued the plumbing contractors for damages on the grounds that they had done their work so negligently

that underground water lines broke, flooded the foundations, and caused caving that necessitated rebuilding. Could the general contractor rely on the fact that the contract between the owner and the plumbing contractors required that all underground pipe be supported on solid brick masonry down to firm soil, and specified how backfill for trenches should be closed and tamped?

**THE ANSWER:** No. (Pinnix v. Toomey, 87 S. E. 2d 893, decided by the North Carolina Supreme Court.)

The court drew a distinction between one's liability for breach of contract, the failure to comply with an agreement, and liability for negligence, which may or may not also constitute breach of contract, but consists of carelessness.

The plumbing contractor would be liable for breaking the agreement with the owner concerning support of the pipes.

But, the general contractor and the plumbing contractors had no agreement, and the latter's liability on the ground of negligence arose under the common-law rule that one is bound to use reasonable care—that which an ordinarily careful person would use—not to damage another person, whether there is a contract between them or not.

In short, the court seems to say that the plumbing contractors were bound to do their work as not to unnecessarily endanger the foundations, regardless of what they were required to do in fulfilling their contract with the owner.

### Dump-truck operator considered employee

**THE PROBLEM:** Gravel-pit operators hired the owner of a dump truck to haul gravel on a yardage basis. The truck owner furnished the oil and gasoline burned by the truck, but he was carried on the pit operators' weekly payroll and deductions were made from his pay to cover workmen's-compensation insurance. Due to his negligent driving, third persons were injured. Were the gravel-pit operators liable for the injury on the theory that the truck operator was their employee and not an independent contractor?

**THE ANSWER:** Yes. (Amyx v. Henry & Hall, 79 So. 2d 483, decided by the Louisiana Supreme Court.)

The court noted the distinction between cases like this one and those where contractors engage truck owners, who select and pay their own drivers. In the latter cases, the truck owner, not the contractor, is liable for the driver's negligence.

### Federal-job subcontractor could sue in state court

**THE PROBLEM:** The general contractor for work on a federal building in Wisconsin sublet part of the work. As required by federal law, he then gave a bond to protect persons furnishing labor or materials. Claiming that he had not been paid, the subcontractor sued in a Wisconsin state court to collect on his subcontract, not on the

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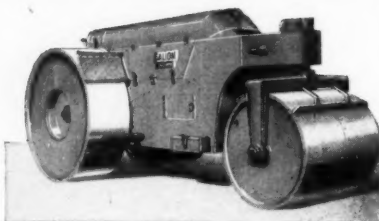
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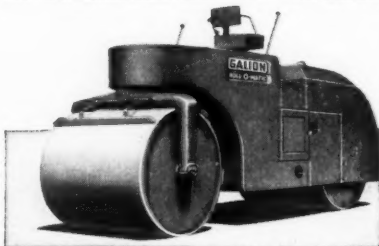
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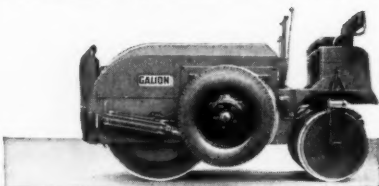
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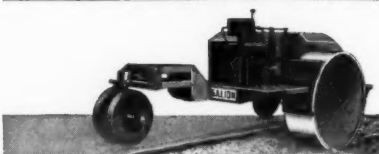
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bond. Could the suit be dismissed because it had not started in a federal court?

THE ANSWER: No. (Voelz v. Milgram Contracting Co., Inc., 75 N. W. 2d 305, decided by the Wisconsin Supreme Court.)

But had the subcontractor attempted to collect on the bond, instead of on the subcontract, suit in a federal court would have been necessary.

### County commissioner accepted illegal kickback

THE PROBLEM: A county commissioner was prosecuted for conspiring with the county's road-oil supplier to receive county roads contracts. It was necessary that a co-conspirator's tes-

timony that money passed from him to the commissioner be corroborated. For that purpose, could a witness testify that he had seen the commissioner on several occasions receive envelopes from a co-conspirator in the latter's office?

THE ANSWER: Yes. (Hardesty v. State of Oklahoma, 291 Pac. 2d 351, decided by the Oklahoma Criminal Court of Appeals.)

The court said that such a conspiracy can be proved by circumstantial evidence as well as by direct proof.

### Mechanic's lien had priority over tax

THE PROBLEM: A contractor completed work for a corporation and, under Illinois law, filed a mechanic's

lien. This was done before an Internal Revenue collector received an assessment list showing delinquent federal taxes against the corporation. Since the corporation was insolvent, did the contractor's lien right have priority over the government lien right?

THE ANSWER: Yes. (United States v. White Bear Brewing Co., 227 Fed. 2d 359, decided by the United States Court of Appeals, Seventh Circuit.)

### Claims against estate of deceased contractor

THE PROBLEM: The estate of a deceased building contractor was insolvent. Under New York statutes, claims against the estate for administration and funeral expenses take priority over ordinary debts left

by the deceased. At the time of his death, the contractor possessed funds against which materialmen, laborers, subcontractors, and architects had statutory mechanics' liens. Did the administration and funeral expenses take priority over the lien rights?

THE ANSWER: No. (In re Estate of Einach, 146 N. Y. Supp. 2d 240, decided by the Surrogate's Court, Erie County, Buffalo.)

The court said that it was not essential to the priority right of the lien that claimants had converted their claims into judgments. Money or a claim "which at a given moment was charged with a trust character for the benefit of materialmen, laborers, etc., does not lose that character by the death of the contractor five minutes later".



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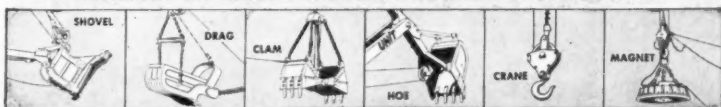
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SEPTEMBER, 1956



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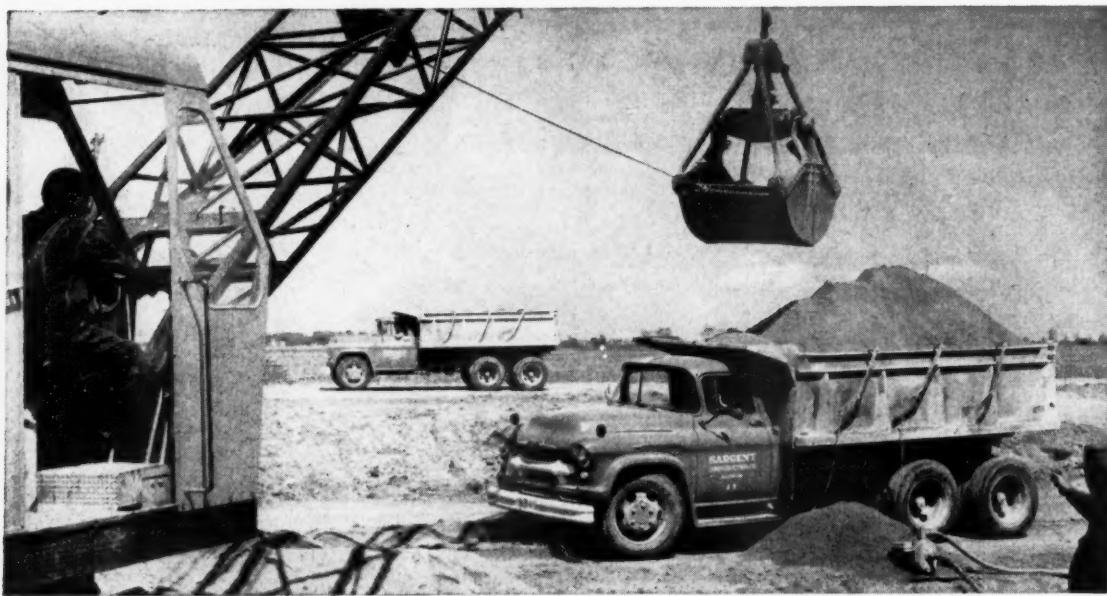
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## Handling methods speed placement of hangar girders

One of the ten big precast, post-tensioned girders is lifted to the roof of the hangar by three cranes. A Manitowoc 50-ton crane handles one end, while two mobile P&H 35-ton cranes use a balanced beam to handle the other end. *Official USAF Photos*

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mud sucked them down on their axles... sometimes two-thirds of the wheels were actually buried... those trucks were literally crawling on their bellies. But they kept rolling. And, to my amazement, we didn't even have to lighten the nine-ton loads!

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What are believed to be the longest concrete beams ever precast have been installed in the \$2.5 million cleaning and painting hangar at Hill Air Force Base, Ogden, Utah. This 274×130-foot structure will provide urgently needed space for the overhaul and maintenance of all types of aircraft at this major Air Materiel Command base.

Weighing 84 tons each, the ten girders in the rigid-frame building are 6 feet 4 inches high at the ends and 7 feet 6 inches high at the center. They measure 136 feet and have a free span of 130 feet. Because of their size, the contractor, Jacobsen Construction Co., Salt Lake City, Utah, exercised more than the usual care to surmount the problems involved in their casting, stressing, and erection.

### Stressing

The 274×130-foot main hangar frame and the shop structures, which bring the over-all width of the facility to 242 feet, were built while the girders were being cast and stressed. Rail-mounted doors divide the main hangar into two sections, one for painting and one for cleaning. The shop structures, providing space for offices and mechanical equipment, are of the lean-to type and are independent of the hangar footings and the precast beams. Spread footings were used for the structure, since sand and silt go to a considerable depth underneath the hangar and made the use of pile foundations impossible.

### Casting and stressing

The 136-foot girders were cast as simple beams in a yard near the hangar, where concrete slabs had been laid to serve as casting beds. Concrete was batched and mixed in a plant setup adjacent to the casting yard. Two sets of girders forms, faced with plywood and braced on the outside by light steel frames, were assembled and installed in two casting positions. External vibration was used until concrete covered the prestressing reinforcement units, then internal vibration was used. Forms usually were stripped in two days, and a curing compound was applied immediately to seal in the moisture. Concrete was placed for some of the girders during cold weather. These girders were cured before forms were stripped, and

CONTRACTORS AND ENGINEERS

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**Rail and dolly method used to move 136-foot girders on ground and roof; post-tensioning is done both before and after huge beams are erected**

Workmen jack up a 136-foot-long 84-ton girder so that a hoisting cradle can be attached. The beam will be moved along rails on a dolly to the hoisting position at the new hangar.



they were protected with canvas coverings and lanterns during the curing process.

After the beams had developed a 4,000 psi strength in the 7-day curing period, they were tensioned to about 65 per cent of ultimate full stress in two stages. The girders were first stressed, two at a time, on the casting bed. They were fully tensioned after they had been erected and were under the full dead load of the roof slabs. These ribbed roof slabs, nearly 11 feet wide and weighing 6 tons each, impose a dead load of 72 tons on each of the interior girders. The two-stage tensioning process prevented overstress in the bottom of the girders and insured an upward pull from the girders to counterbalance the weight of these slabs.

#### Move girders by rail

While the girders were being cast, a rail system of moving the beams on the ground and at the top of the hangar was being prepared. The ground system consisted of rails mounted on 18-inch I-beams that rested on a concrete slab at each end of a girder. As soon as a girder had been stressed, it was jacked up, placed on dollies, then winched along the rails to a spot near the hangar. Here the girder rested on steel pedestals, similar to those it would rest on at the top of the walls, until a lift was ready to be made.

The job of hoisting the beams into position was handled quickly, nine of the beams being raised in five days' time. Shurtleff & Andrews, Salt Lake City and Orem, Utah, used three cranes for the lift. A Manitowoc 50-ton crane handled one end of a girder, while two mobile P&H 35-ton cranes used a balanced beam to lift the other end.

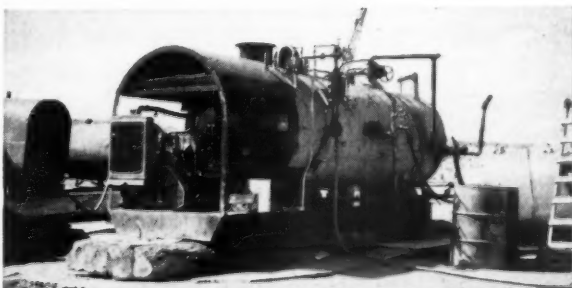
After the girders had been lifted to roof level by the cranes, they were lowered onto dollies positioned on tracks. The tracks, installed on the spandrel beams at the top of the hangar walls, made it possible for the girders to be winched into position.

Two ½-hp motors powered the winches, which used ½-inch cables to move the girders along the roof. The beams were moved at a speed varying from 16 inches per minute at the start to 3 feet per minute at the end of the

(Concluded on next page, col. 1)



Two of Thatcher's three rigs hard at work on the Chicago Filtration plant site. Hammers are powered by 135-150 lbs. of steam.



Skid-mounted boiler sets up anywhere — keeps steam lines short. Built for heavy-duty service.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 297

**Cleaver-Brooks boilers provide steam to drive first of 100,000 piles for multi-million dollar Chicago filtration plant**

# "strictly reliable,"

says HARRY THATCHER, Jr., of Thatcher Engineering Company, pile-driving contractor for the job.

"WE'RE driving up to 134 forty-five foot poles in an eight hour day with our Cleaver-Brooks boilers. We were the first to use Cleaver-Brooks boilers for pile driving in the Chicago area, and our experience proves they are unusually well built and do a good job. Frankly, we wouldn't experiment with any other boilers."

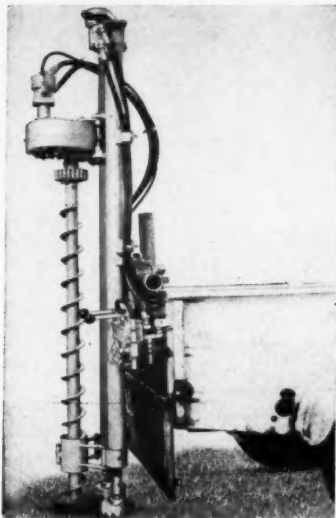
Thatcher Engineering Company, a repeat Cleaver-Brooks buyer, speaks from years of experience. Their first unit was purchased in 1948, the second in 1949 and the third in 1956. All told, thousands of hours of profitable job-time have been logged.

"Our experience with Cleaver-Brooks boilers proves they are strictly reliable even when worked hard", summarized Mr. Thatcher. "We've driven this equipment 40 hours a week, sometimes for 7 or 8 months at a time."

Investigate the advantages of skid-mounted or mobile Cleaver-Brooks boilers, built for all-season profits . . . for ready mix or hot-mix plant duty, asphalt heating, winter concrete curing, tank-car heating. Quick starts, fast firing plus a steady supply of dry steam enable you to get more done per day. Cleaver-Brooks Company, Road Machinery Division, Dept. K, 397 E. Keefe Ave., Milwaukee 12, Wis.



TWENTY-FIVE YEARS OF LEADERSHIP  
BY THE ORIGINATORS OF THE SELF-CONTAINED BOILER



The new Cardox general-purpose drill mounts on the rear of a truck, tractor, or other vehicle.

### New general-purpose drill operates in any direction

■ A new general-purpose drill, mountable on a flat-bed truck, crawler or wheel tractor, or other vehicle, is announced by the Cardox Corp.

Designed to simplify many jobs, the drill can be used in any fore-and-aft or lateral direction at any angle from horizontal to vertical. It is operated and controlled hydraulically, the power supplied by a power takeoff on the carrier vehicle.

The unit handles augers from 3 to 12 inches and will drill 6-inch holes up to 60 feet in average shale. It has maximum feed rate of 20 fpm.

The positional change of the drill mast is simple, with an extremely accurate control. It can be disconnected quickly for use as a trench drill, or for horizontal drilling at various levels.

For further information write to Cardox Corp., 307 N. Michigan Ave., Chicago 1, Ill., or use the Request Card at page 18. Circle No. 74.

(Continued from preceding page)

winching operation. During this process, the biggest problem for superintendent P. A. Maxwell, who operated the one-man mechanical controls, was to keep the ends of the girders moving at the same speed to prevent a skew alignment. When a beam reached its position along the hangar walls, it was jacked up so that the dollies could be removed from underneath it; then it was lowered onto its pedestals.

#### Personnel

Roberts & Schaefer Co., Chicago, Ill., and New York, N. Y., designed the hangar, which was built by Jacobsen Construction Co., Salt Lake City, Utah. The resident engineer for Hill Air Force Base construction is Lawrence E. Fine. The Air Force administrator for the project was Col. Edwin M. Eads, Air Force Installations Representative, South Pacific Region. Construction of the facility was handled by the South Pacific Division of the U. S. Army Corps of Engineers, which is headed by Brig. Gen. William F. Cassidy.

THE END

### In-place rock breaker towed by most tractors

■ A new in-place material reducer that crushes all types of native rock to minus 2-inch-size aggregate right on the roadbed is announced by Wm. Bros Boiler & Mfg. Co. Known as the Preparator, the machine breaks over-size materials by impact hammers at production rates of up to 400 cubic yards per hour.

Material up to 30 inches in diameter is crushed by 22 free-swinging hammers made of special-alloy steel. The hammers are mounted on a common shaft and are driven by poly V-belt drive direct from the engine.

Besides reducing native rock deposits, pit-run gravel, and over-size quarry rock, the Preparator is recommended for pulverizing old black-top paving.

The Bros Preparator material reducer can be towed by any tractor of 30 or more horsepower.



ommended for pulverizing old black-top paving.

The reducer can be drawn by any tractor of 30 or more horsepower. It is available with either gas or diesel engine.

For further information write to the Road Machinery Division of the Wm. Bros Boiler & Mfg. Co., 1057 Tenth Ave. S. E., Minneapolis 14, Minn., or use the Request Card at page 18. Circle No. 13.

# BIGGER ROADBUILDING

## Michigan Gravel Hauler Elmer Burger Hauls A Full Truck And Trailer Load In One Fruehauf-Schonrock Cable Dump!

40,000 POUNDS OF GRAVEL is a normal load for a combination hoist-type dump truck and full Trailer. But, with only one tractor and a Fruehauf-Schonrock Cable Dump Trailer, Elmer Burger, an owner-driver hauling for Walter Morrell of Redford, Michigan, hauls a full 40,000 pounds per trip.

YOU SAVE BIG MONEY in equipment outlays when you move as much sand and gravel with a two-unit rig as you would with a three-unit combination. Not only is your investment lower, but you'll have fewer upkeep and operating expenses due to the simplicity of the Fruehauf-Schonrock Cable Dumping Mechanism, which has only five moving parts.

AND YOU'LL FIND that the new

## FRUEHAUF TRAILERS

"ENGINEERED TRANSPORTATION"

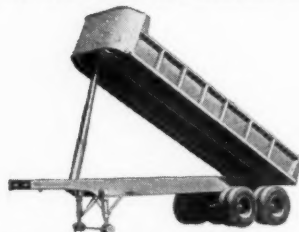
Fruehauf-Schonrock Cable Dump Trailer . . . can dump with the tractor turned at right angles to the Trailer . . . can winch itself or the tractor out of holes . . . has all wheels safely on the ground while dumping . . . takes advantage of all Bridge Formula Laws.

INVESTIGATE the Trailer that does the construction hauling job of two straight dump trucks or a dump truck and Trailer combination — for your own greater profits!

PROFIT-DESIGNED FRUEHAUF DUMP TRAILERS FIT EVERY CONSTRUCTION NEED . . . AND CAN ALWAYS BE



Lightweight, frameless Hopper-Type Dump Trailers are equipped with either windrow or cross-hopper dump gates. Unit shown has 10 yard capacity.



Fruehauf Hoist-Type Dump Trailers are designed for maximum bridge formula payload capacity and available in many capacities.



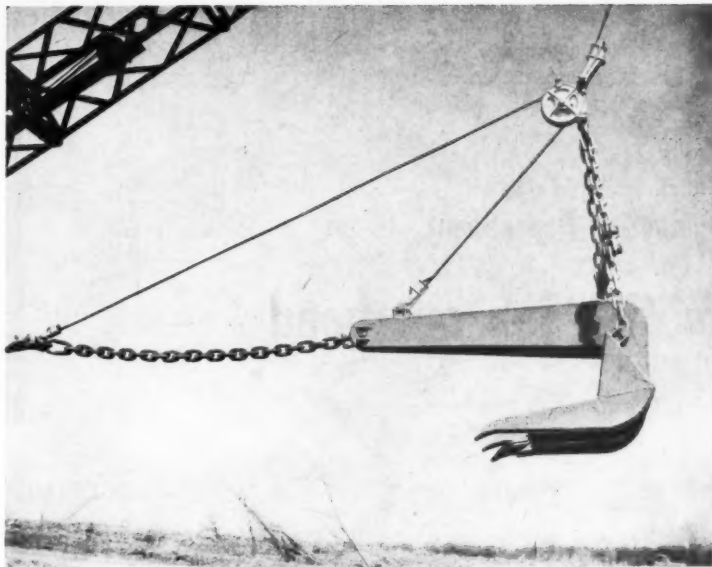
Twin-screw Bulk Cement Transport is loaded through 24" manholes . . . discharges 125 barrels in approximately 12 minutes.

The Yake clearing bucket is a modified dragline-type unit said to make clearing operations more efficient and economical.

### Special bucket designed for clearing operations

■ A dragline-type bucket especially designed for clearing operations is being offered by the Schnacke Mfg. Corp. The unit is also said to be an efficient tool for use in ripping up concrete pavement.

Designed for use on machines with up to 1-cubic-yard capacity, the Yake clearing bucket is of plate-steel all-welded box construction. Chains and fittings are of manganese steel. The teeth and wearing points are hard-surfaced for longer wear, and pins and the blades at the cutting edge of



the bucket are said to be easily replaced.

According to the manufacturer, field tests involving the Yake bucket have shown savings of up to 50 per cent over the use of a conventional dragline or clamshell bucket in clearing operations. Designed to dump at any time during an operation, it can pile or load brush, undergrowth, trees, and stumps within swinging reach of the dragline.

The bucket is 6 feet 7 inches in length, 4 feet wide, 3 feet high, and weighs approximately 1,800 pounds. The 4-inch-wide teeth are 23 inches long to the cutting edge.

For further information write to Schnacke Mfg. Corp., 1016 E. Columbia St., Evansville 7, Ind., or use the Request Card at page 18. Circle No. 150.

### Offer power drive for line of batchers

■ The C. S. Johnson Co. has announced an optional power-drive arrangement with electric motor for all Lo-Bin trolley batchers. The power unit can be fitted to any Lo-Bin batcher of 22 or 44-cubic-foot capacity or on combination cement and aggregate batchers.

Standard Lo-Bins are equipped for hand-crank operation. Conversion of units in the field to power drive can be done only on late models, according to the manufacturer.



The C. S. Johnson power drive for Lo-Bin trolley batchers.

The Johnson Lo-Bin is designed with bin capacities of 8, 20, or 30 tons, arranged for two, three, or four aggregates. The 30-ton unit can be arranged to handle three aggregates and one cement. A 40-ton Lo-Bin also is available with three equal compartments for aggregate only.

The Lo-Bin features an exceptionally low charging height of only 7½ or 9½ feet, depending on bin capacity. The batcher travels under the bin gates, successively weighing each material. Cantilevered design lets the unit ride out beyond the end of the track for direct discharge onto a conveyor or into the mixer skip.

For further information write to the C. S. Johnson Co., Box 71, Champaign, Ill., or use the Request Card at page 18. Circle No. 78.

### Austin-Western promotes

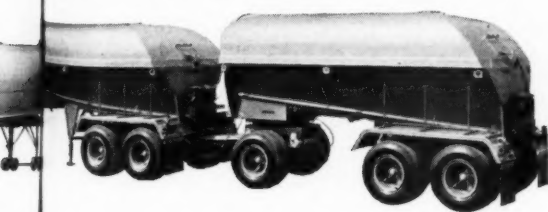
The Austin-Western Works, Construction Division, Baldwin-Lima-Hamilton Corp., Aurora, Ill., has promoted J. Arthur Fitzenz to the post of manager in charge of domestic sales. He will be assisted by A. Merrill Smith.

Fitzenz is a former district manager and assistant sales manager. Smith had been district manager in Texas and the Southeast.

# PROFITS



SERVICED BY ONE OF FRUEHAUF'S 80 BRANCHES



Operated singly or in combinations, Fruehauf Twin-Panel Airlide Bulk Cement Transports have capacities from 75 to 125 barrels. Airlides converge at single discharge gate.

For more facts, use Coupon, or Reader-Reply Card opposite page 18 and circle No. 300

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## The Engineering Department

# Estimating job overhead



by **GEORGE E. DEATHERAGE, P. E.**  
Construction Consultant

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MOST ECONOMICAL  
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- A Two-Component,  
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- For Sealing Sawn  
and Formed Joints

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 301

Overhead is divided into two parts for estimating purposes—the direct job overhead and the indirect or fixed office overhead.

This division makes it possible to estimate and charge to one specific job all indirect items that benefit one particular job. The job overhead expense has no effect on the units estimated for labor and material, which have to do directly with erection and production. This leaves only the fixed

office overhead to be added at the end of an estimate before the price of a total bid is calculated.

Some complications arise when tools and equipment are listed under job overhead, since even part of this annual cost cannot be absorbed by one job. It is a good practice, from an accounting standpoint, to charge tool and equipment expense to the main office fixed assets, then charge rental rates for the equipment to the job on

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CARRY THE  
TRADEMARK**



**MODEL MSO-D**

Multiple axle drop bed semi.  
capacities 35 through 75  
tons. Drop deck or flat bed.



**MODEL XTT**

Tandem axle tilt trailer  
(low type), capacities 13  
through 20 tons.



**DUMP TRAILERS**

Single or tandem axle mod-  
els. Standard capacities 8  
through 15 yards.

MANY OTHER  
"TRANSPORT" MODELS



## NEW MODEL GPRY

Tandem Axle Removable Gooseneck Trailer. Full width tubular cambered axles. Available as a beam trailer, flat or drop platform trailer, or as shown with removable side platforms with sliding outriggers. Also available with triple or trunnion axles. Standard capacities 15 through 60 tons. Write for complete information.

"TRANSPORTATION ENGINEERING A SPECIALTY"



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**CONTRACTORS AND ENGINEERS**

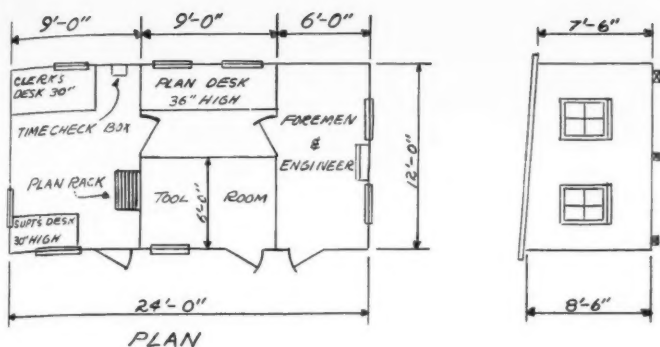


Figure 1. A standard construction office.

This is the ninth of a series of articles on Construction Management by George E. Deatherage, P.E., construction consultant. The articles are based on an eight-volume "Manual of Advanced Construction Management" published by Geo. E. Deatherage & Son, P. O. Box 921, Lakewood, Fla. The manual is used in a training course for superintendents and project managers, and is directed primarily at those contractor employees who have reached the foreman level or its equivalent, and who need practical help in order to take complete charge of construction projects themselves.

mate summary" in the labor and materials column. Unless bids state that the cost of the bond shall be added to the contract price, the cost is added to the bid total. The cost of the bond is the same, whether it be in 100 per cent of the contract price or only 50

per cent of the contract price. There is ordinarily no saving in premium for the lower amount. If the job is to be done under a federal contract, the surety bond will be divided into two documents—the performance bond and the payment

which it is being used. The rate charged would be equivalent to prevailing rental rates. Then the difference between the rental rate and the cost of the equipment can be charged off to office overhead.

#### Starting the estimate

After the estimator has gone over plans and specifications and has visited the site, he gets down to the job of actually posting items on estimate

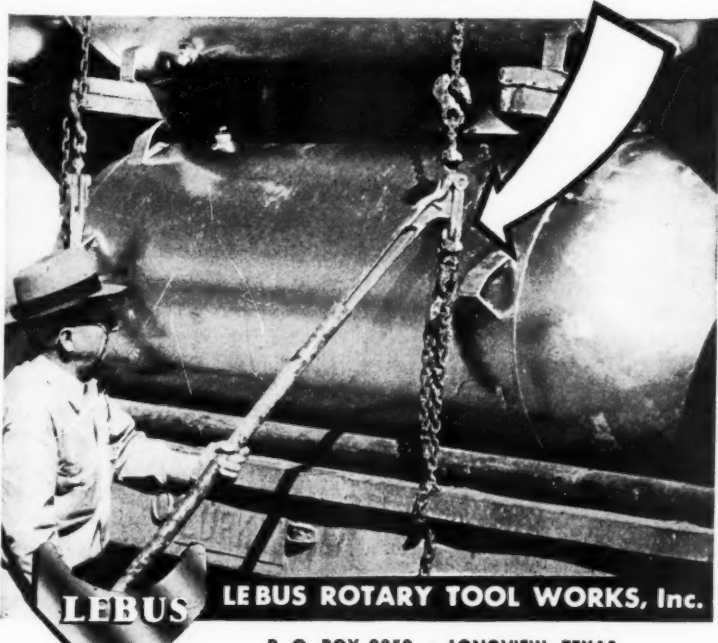
sheets. These items should be posted in the same sequence as they appear on the estimate check list, for this precludes the possibility that some items may be missed.

The first item to consider is the performance or surety bond, which usually comes to 1 per cent of the contract price after overhead and profit have been added. But since the cost of the estimate is unknown at this time, it is usual to post "see esti-



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# SYNTRON

## POWER TOOLS

### Economy and dependability on job after job

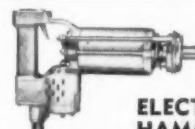
## TOOLS THAT REDUCE JOB TIME AND COSTS

Here's the finest line of power tools you will find anywhere. Every power tool built by SYNTRON is designed to do production work fast, and efficiently. Tough jobs are normal jobs for SYNTRON POWER TOOLS. That's why Syntron tools last longer and are more powerful, more compact, easier to handle. Syntron's tools have a reputation for quality and dependability from the powerful belt-driven saws, longer lasting ELECTRIC HAMMERS and CONCRETE VIBRATORS to the self-contained Gasoline Hammers.



### Belt-Driven ELECTRIC SAWS

Powerful, high-speed production cutting of hard or soft wood, concrete, plastic, plaster board, etc. Models with 8 1/2" or 10" blades.



### ELECTRIC HAMMERS and HAMMER DRILLS

Automatic, self-rotating drill bit, fast, easy drilling, are built for years of trouble-free service. Electric magnetic hammers for chipping, scaling, cutting, etc.

### GASOLINE HAMMERS PAVING BREAKERS and ROCK DRILLS

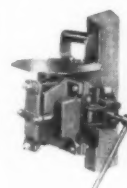
Completely self-contained require no accessories. Portable, powerful for digging, busting, tamping, drilling, etc. Bit rotates automatically for drilling.



### CONCRETE VIBRATORS

#### Mass and Form

Vibration produces better finished concrete at lower cost. Electromagnetic models clamp direct to wall forms. Gasoline or electric models for mass vibration.



For more information about Syntron Power Tools

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## SYNTRON COMPANY

227 Lexington Ave.

Homer City, Pa.

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## management

bond—each in 50 per cent of the contract price. The premium will amount to one per cent of the contract for both. A bid bond usually costs \$5 and is ignored in the estimate.

Workmen's compensation insurance, public liability and property-damage insurance also cannot be entered before the estimate is complete, and these too are carried forward to the estimate summary.

Workmen's compensation rates are either set or approved by the state, the rates varying in accordance with trade classifications. The contractor's payrolls are periodically audited by either the state accident commission or the insurance carrier, and the

premiums are calculated from the trade classifications and the nature of the work to be done. The contractor is then billed for the premium, and thus secures data to arrive at an average rate to be paid per \$100 of payroll. This includes all trades on all classifications of work. The average rate is then calculated as a percentage of the contractor's direct payroll, including the amount paid for office help. This rate does not include subcontract labor; the subcontractor will carry his own insurance rates. Though rates will vary, depending on the safety record of the contractor, they will usually remain uniform. On large work, workmen's compensation and other insurance should be calculated separately and posted to the estimate, since they

could amount to a considerable sum.

It is important to post in the estimate labor column only labor to be done by the contractor's own forces. This is the base figure to which the average insurance percentage is applied to arrive at the insurance cost.

Public liability and property damage insurance have a premium cost in accordance with the insurance limits specified. Insurance for public liability may be stated as \$50,000/\$100,000, which provides up to \$50,000 for any one person injured in an accident and \$100,000 for any persons injured in one accident. Generally, such a low amount of insurance should not be taken. An increase to \$100,000/\$300,000 will not add a great deal to the premium in the course of a year.

The employer's share of social se-

curity and other federal taxes will also have to be added to the estimated labor. Altogether, the total taxes and insurance premiums for a firm doing a \$200,000 business in constructing commercial and light industrial facilities will average about 10 per cent of the payroll. These values, however, change yearly with changes in the tax laws and compensation rates, and for this reason, they should be reviewed at least once a year. In many states, compensation, taxes, and insurance will amount from 10 to 15 per cent of the total labor costs. Special rates may be in effect for work on such facilities as cofferdams, dams, and steel transmission lines.

For this reason, the estimator should secure information on rates prevailing in the locality of the job before arriving at a percentage of the labor cost—including about 1 per cent extra for clerical work—that will cover all premiums.

A guaranty warranty—for the usual 12-month guaranty on labor and materials—may be taken in the form of a bond to take care of any expense anticipated in this regard. A bond of this kind required by the terms of the contract cannot be avoided and a maintenance bond will have to be secured. The premium is posted in the material column.

Fire and storm-insurance rates, varying with the class of work to be done and the fire zone in which the job is located, can be secured from an insurance broker and posted in the material column. According to the AIA standard documents, the owner carries fire insurance.

### Permits

The cost of permits of various kinds will have to be figured in the estimate. This includes building permits, which are usually about 50 cents per 1,000 cubic feet of building; add for alterations permits, and special permits. The latter includes permits needed if curbs are to be cut for driveways, sidewalks removed or placed, and similar work done.

State permits will have to be secured if heavy loads are to be transported over highways. The estimator will have to become familiar with all municipal, county, and state regulations on these matters, and post the expenses for each item in the material column of the estimate.

Other items that will have to be covered include progress photographs and contractor's signs. The photographs, which are supplied periodically in a specific, predetermined number, range in price from \$5 to \$7.50 for each negative and \$1.50 for each 8×10 print. Cloth backed prints cost a little more. Local quotations on this item can be secured and posted in the material column. A small contractor's sign will be about 4×6 feet and cost about \$25. On federal or state work, signs may have to be large enough to contain the name of the work, project number, and a listing of all subcontractors. These may be 10×16 feet and cost several hundred dollars each. In securing local prices, allow for labor involved in erecting the signs or purchase them in place.



**"I built my business on GarWood dependability!"**

**—says William J. Booth, Pinellas Park, Florida**



Here, one of Bill Booth's "75's" works with a Vibra-Flotation attachment packing sand for a school foundation. Another "75" is currently being used to dig drainage ditch for the development of river front property. His third Gar Wood machine works in a pit, loads out 1200 yards of fill per day.

Bill Booth knows from experience that good equipment is essential to success as a contractor. He reports: "I started in the excavating business with a Gar Wood '75B' dragline five years ago. Today my equipment spread includes three Gar Wood machines. They've been good, dependable machines... delivering the production I need when I need it!"

This kind of low-cost, dependable production is the result of many Gar Wood "75" design advantages. Independent travel while swinging gives you mobility to speed loading... you can hoist or swing while moving. Power actuated drum clutches increase production by reducing operator fatigue. Direct manual controls retain true operator "feel".

Maintenance is easier, too. Gar Wood's massive crawler base takes extreme shock and strain. Heavy-duty conical hook double rollers eliminate pin strain and rocking under load. Compact machinery deck is easily accessible for adjustments or servicing.

Gar Wood excavators are built by specialists in ¾ yard machines. Call your Gar Wood dealer and find out how this specialization can pay off on your jobs. Or, write to: Customer Service Dept., Gar Wood Industries, Inc., Wayne, Michigan.

## GAR WOOD INDUSTRIES, INC.

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Gar Wood-Buckeye Hi-Way Wideners



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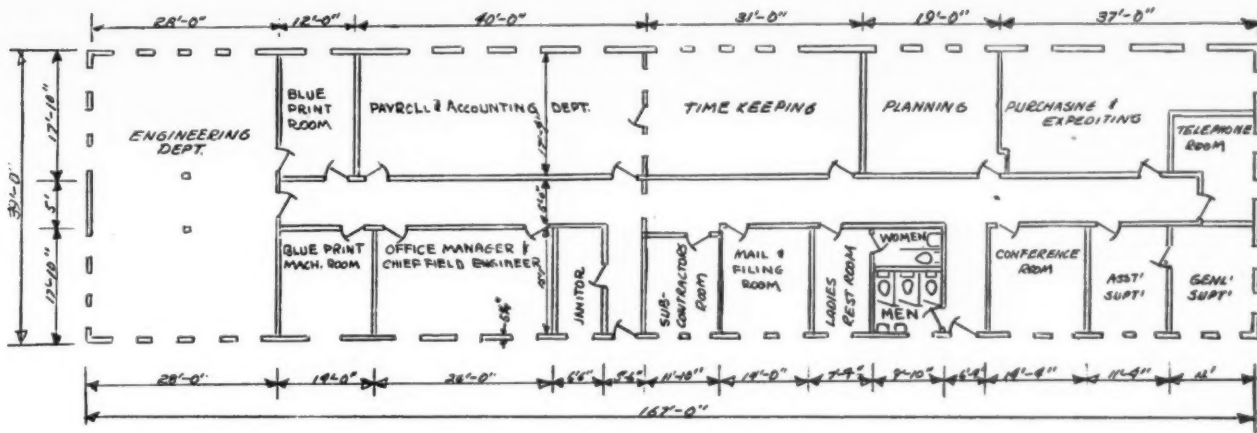
Gar Wood Winches



Gar Wood-St. Paul Hoists & Bodies

For more facts, use Reader-Reply Card opposite page 18 and circle No. 305

Figure 2. A large construction office.



**Temporary closures or barriers**

Whether temporary closures or barriers consist of a simple fence or an elaborate overhead sidewalk bridge, they will have to be designed in the rough and each component part estimated in material and labor. Salvage may be credited to the job.

In large cities, much of this protection may be rented for the duration of the job, the price of the facility being entered on the estimate after local quotations have been solicited. On highway work, provision will have to be made for detours, crossings, lights, and barricades, plus provision for their maintenance. Much valuable information on these subjects can be obtained from the Safety Hand Book of the AGC, Washington, D. C.

If temporary closures and barriers may be used over again on another job, they should be added to the inventory of the contractor. If they are extensive, the items should be sketched roughly on a piece of 8x11-inch cross-section paper, and all material billed as if it were part of permanent construction. The sketch is then attached to the estimate.

**Temporary facilities**

Temporary gas and heat, light and power, water, telephone, and field offices will have to be taken into account in the estimate. In considering power requirements, the total horsepower needed on the job should be ascertained and arrangements made with the local power company for an approximate price. Temporary water services will vary according to the size of the job, its location, and other factors. In a city, a connection may be made to the nearest fire hydrant. On large work permanent mains may be installed early and used as water facilities. After the cost of pipe and fittings has been figured, 75 per cent is added to the cost of the service for the labor needed for installation. Salvage on this item is usually not more than 25 per cent. Prices for phones may be secured from the local telephone company, and it may be best to install pay phones so that unauthorized personnel or subs will not be able to run up a large long distance bill. Field offices, as illustrated in figures 1 and 2, may be selected from any one of a number of types. Prices

(Continued on next page)

## REDUCE CYCLE TIME BETWEEN CUT AND FILL



## GET MORE TRACTION . . . LONGER TIRE LIFE with Firestone NYLON TIRES

**F**IRESTONE NYLON TIRES are built to keep your job on the move. They have the extra traction and extra strength needed to reduce your equipment's cycle time and tire costs.

The treads of Firestone Nylon Tires are built to give maximum traction on the toughest haul, and they are extra tough to resist cutting. Double-thick sidewalls give added protection against cuts and snags.

Firestone's Safety-Tensioned *Gum-Dipped®* nylon cord body gives the greatest protection against impact breaks . . . flex breaks . . . heat failures . . . and water damage.

Firestone has a complete line of nylon off-the-highway tires . . . job engineered tires for every piece of earthmoving equipment.

Call your Firestone Dealer or Store for cost-cutting Firestone Nylon Tires and complete off-the-highway tire service.



**A TIRE FOR EVERY ROAD, LOAD AND CONDITION OF SERVICE**

**GROUND GRIP GG WIDE BASE ROCK GRIP RG WIDE BASE ALL NON-SKID ALL TRACTION RIB EXCAVATOR**

**WHEN YOU BUY NEW EQUIPMENT OR REPLACEMENT TIRES, SPECIFY FIRESTONE**

Enjoy the Voice of Firestone on radio or television every Monday evening over ABC

For more facts, use Reader-Reply Card opposite page 18 and circle No. 306

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## management

can be figured from the prices for materials, or roughly on the basis of 35 to 40 cents per cubic foot.

Sanitary provisions for practically every job will have to conform with municipal, county, or state codes. One way to secure a lower estimate cost for such work is to use secondhand fixtures that may be picked up at a reasonable price.

Temporary stairs in multistory buildings should meet safety requirements, having hand rails, toe boards, and at least partially closed risers to prevent material from falling through. Stairs should be at least four feet wide so that material can be carried up and down easily.

## Tests

Specifications should be consulted as to requirements for periodic tests of materials, such as are usually required for concrete. Ready-mix plants are ordinarily in a position to furnish test certificates by some recognized agency for each load, and usually, without charge. Quotations may be secured from local testing laboratories for estimating purposes. If the job is large, it will pay the contractor to set up his own test laboratory. In this case the estimate would have to provide for a temporary shanty, light, heat, and equipment and personnel. In most municipalities, routine tests of plumbing and electrical installations are made by the city inspectors and the costs absorbed by the respective subcontractors.

Fuel, oil, and gasoline, if not figured in the rental price of machinery, must be carried as part of job overhead. The cost of fuels can be cut in the estimate, if work is being done for a tax-free agency. In this case, taxes may be rebated. If a considerable amount of fuel is used, underground tanks might be installed so that tank-wagon prices might be secured for the estimate.

Office supplies—a minor item on a small job—can run into a lot of money on a large one. A check list might be used for all office supplies so that items can be ordered in bulk at a substantial saving to last the entire job. Miscellaneous supplies, including bolts, brooms, and paper towels, may be handled in the same manner.

Even the most simple job may require that samples of various materials be supplied to the owner for his approval. Getting the samples and getting them to the owner involves a cost that can be charged to direct job overhead. Another legitimate overhead expense is a bond on subcontractors, which may be needed for protection in case advantage is taken of a low bid.

## Allow for price changes

Price changes in labor and materials—particularly on a drawn-out job, should be allowed for in the estimate. Advance information on prices may be secured from the forecast made by the Bureau of Labor Statistics. Information concerning probable increases in wages for various trades in the locality may be sometimes secured from union labor headquarters. Developments in welfare provisions are posted in Bulletin No. 1091 of the U. S. Department of Labor.

Provision will also have to be made for supplying badges required on federal and some private jobs, and brass checks that assist in keeping time and securing tools. Time lost at the gate in signing up employees, the loss of one hour per week per permanent employee, and the number of days' cleanup work at the end of the job should also be figured into the estimate.

Overtime has to be calculated from schedule requirements and the type of work being done. Cutting and patching, always necessary on a job, cannot always be charged to the trade or unit benefiting from the work and must be carried as job overhead. Usually, a lump sum can be allowed for this item.

The survey charges and layout labor and material should be included in the estimate, even though the owner is responsible for the property survey. If the contractor agrees to survey the property, the estimator can secure a price for this work from a licensed surveyor. Topographical surveys may be made by a surveyor or the crews of the contractor. In the latter case, the estimator will have to figure the number of days required to do this job by a crew of four men. A topographical map on 10-foot contours will cost about \$30 an acre. Aerial topography can be used on large work with a saving in time and money.

The street obstruction bond, required by municipalities to make sure that streets, sidewalks, and municipal property will be left in the same condition as it was found, is furnished on a yearly basis and must be renewed annually. The cost, which can be secured on application, is many times charged as a fixed expense, since it benefits all work being done in a specific municipality.

If soil loading tests are required, figure about \$300 to construct a load test platform and conduct an ordinary load test. Repeated tests will come to about \$150 each. If test drilling is to be extensive, concerns may be given this work. They will quote a price per foot, depending on the

# "We're Hauling 20-Ton Loads in New Jersey's Heavy Traffic—and Getting 7 MPG!"

— says Anthony Ferrante of Somerset Crushed Stone, Bernardsville, N. J., in reporting on his 25 GMC trucks



**WHILE CLOCKING 50,000 TOUGH MILES A YEAR**—in a punishing combination of on-and-off-the-road work—Somerset's GMC W635's turn in amazingly low operating figures. Down-time has been considerably less than the other-make trucks in the fleet, Truck Manager George West reports. And the new GMC rear ends have given them exceptionally satisfactory service. Yet these GMC's aren't pampered. In fact, each rig puts in two years of hard work before it gets even a carbon and valve job.



**POWER TO ZOOM 14-YARD LOADS UP OUT OF THE PIT FAST** comes from GMC's big 225-hp "503" engine. And once on the highway, that quick-stepping power helps cut trip-time—make more trips during normal working hours. What's more, Somerset is getting this standout GMC performance on an amazing 7 mpg — even though they travel some of the busiest New Jersey highways. That's a full mpg better than comparable trucks doing the same job.



**"THOSE GMC'S ARE NO. 1 IN OUR FLEET,"** says Somerset owner, Anthony Ferrante. His reason: Simply that the GMC's cost less to operate—so they make more money. Result: They have 6 more new GMC W635 tandems on order as this is written!

**GMC TRUCK & COACH**  
A General Motors Division

For more facts, use Reader-Reply Card opposite page 18 and circle No. 307

CONTRACTORS AND ENGINEERS

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depth, the nature of the strata, and location of the work. Prices vary from \$3.50 to \$8 per foot.

Tool shanties and temporary sheds cost 20 to 25 cents per cubic foot and, where practical, they should be built on skids so they can be moved. Items like ladders and scaffolds should be figured in with the unit on which they are used. However, a lump sum should be allowed to cover their use on various parts of the job. The first-aid station will require a temporary building, and its personnel should be carried as job overhead. On large work, the insurance company carrying the risk will supply the nurse and furnish the equipment and supplies without charge.

Since temporary roads and parking facilities vary in size from job to job, the estimator will have to calculate his needs and the cost of these facilities for each individual project. On large jobs, railroad sidings may have to be provided. Figure about \$600 per turnout, and from \$7.50 to \$10 per foot for trackage. Salvage can be credited to these costs.

#### Winter conditions

Winter usually requires changes in construction techniques, and the wise estimator will always be on the lookout for additional costs involved in doing work during cold weather. Excavation of frozen ground, protection of concrete and water lines, purchase of anti-freeze, and heating all involve extra costs.

If the contractor is responsible for liquidated damages, any expense in connection with overtime paid to maintain schedules, premium prices paid for materials, double-shift premium pay, or additional supervisory personnel must be allowed for in the estimate. If these items are ignored, contingent damages come out of anticipated profit.

Though contractors should avoid housing and feeding workmen whenever possible, they may be required to do so on some jobs. It is best to secure quotations from specialty concerns on a per-man basis. If a contractor attempts to provide these facilities himself, he is almost sure to lose money from the start.

Storage and protection of materials will come under job overhead on the estimate. The ideal situation is to have materials arrive on a job as they are needed so that rehandling is unnecessary, but this is rarely the case. The estimate will allow for costs of storing and protecting materials. This cost will also cover tarps and other materials needed to protect such items as structural steel and cut stone.

Aside from ordinary taxes on labor and materials, the estimator will keep a close watch on customs duties, port fees, taxes on foreign corporations doing business in the state where the work is located, and make sure that such costs are included in the estimate. Costs for the use of patented processes may be entered under patent royalties under job overhead.

Allowances should be made too for time lost because of bad weather, vacations, replacement personnel; the printing of special forms, and miscel-

laneous items not covered in the unit prices. This includes land rental for storage space, payroll insurance, legal and notary fees, and petty-cash items.

Money should also be provided for demurrage, a lump sum being figured into the estimate, since this will take place no matter how well a job is organized. Money must also be allowed to cover drastic or ambiguous contract provisions, particularly if the work is being done under federal contract, where the contractor is responsible for all failures. Federal agencies take the attitude that they are never wrong, and they cannot be sued without permission from the government.

All these job overhead expenses are indirect costs, not ordinarily figured in the labor and material estimating units. Should they be overlooked in

the estimate, the items must be paid for out of profit. This expense which totals from 5 to 10 per cent of the cost of a job, may sometimes absorb profits completely.

*(Next month's article will deal with "The Engineering Department—Estimating plant and equipment overhead.")*

#### Divisions consolidated by Armco Drainage

The Iowa-Nebraska and the Missouri-Kansas divisions of Armco Drainage & Metal Products, Inc., Middletown, Ohio, have been consolidated into a new Midwestern division. The former manager of the Missouri-Kansas division, A. J. Mistler, is manager of the new division, which is located in Topeka, Kans.

#### Wire fabric in topping

■ Fastening welded wire fabric to concrete in the bituminous resurfacing of roads is detailed in a mailing piece from Remington Arms Co., Inc. A job photo shows the Model 455 stud driver fastening the fabric in place prior to the bituminous coating process. The application, and the advantages said to result from use of this method, are described in the literature.

To obtain File No. 17-F write to Remington Arms Co., Inc., 939 Barnum Ave., Bridgeport 2, Conn., or use the Request Card at page 18. Circle No. 60.

*Blasting caps can cripple and blind! Lock them away from the children!*

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production  
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with...

## HENDRIX DRAGLINE BUCKETS

A TYPE FOR EVERY DIGGING PURPOSE

1/4 to 40 Cubic Yards

All Hendrix Buckets available without perforations

HENDRIX MANUFACTURING CO., Inc.

MANSFIELD, LOUISIANA



See you at the ROAD SHOW — CHICAGO  
Jan. 28-Feb. 2, 1957

For more facts, use Reader-Reply Card opposite page 18 and circle No. 308



The new laborer's platform extension for Morgen scaffolding permits wheelbarrows and carts to deliver material directly to masons.

### New platform extension for building scaffold

■ The Morgen Mfg. Co. has announced the production of a new laborer's platform extension, part No. M-75, for its building scaffolding.

The new platform extension makes it possible to extend the laborer's plat-

form so that it is wide enough for materials to be wheeled in carts or wheelbarrows and thus speed up stocking. The manufacturer reports that the new extension will fit all models of Morgen scaffolding produced since 1952.

Morgen scaffolding consists of a 10-foot base section with interchangeable extensions of 2, 6, and 10 feet for greater flexibility and additional height. Extensions fit into the base section in sleeve-like fashion. Each piece of Morgen scaffolding is light enough to be handled by one man and can be hauled in a pickup truck. Any height tower can be easily and quickly erected by two men without the use of tools or bolts.

For further information write to the Morgen Mfg. Co., 117 W. Third, Yankton, S. Dak., or use the Request Card at page 18. Circle No. 98.

### Thor branch moves

The Milwaukee, Wis., branch of the Thor Power Tool Co., Aurora, Ill., manufacturer of portable air and electric power tools, has moved to a new building at 3911 W. Greenfield Ave., Milwaukee.

Headed by Clarence B. Bergren, the branch serves Wisconsin, Minnesota, North Dakota, the eastern half of South Dakota, and the upper peninsula of Michigan.

## Waterstop in place in seconds!



LABYRINTH WATERSTOP after first pour has been made and form removed. The grooves receive the concrete from the second pour, providing an interlocking joint.

Just a few seconds were needed to nail this LABYRINTH WATERSTOP to the form... just a few seconds and water seepage worries were over before they could ever have a chance to start. LABYRINTH WATERSTOP forms a waterproof bond between two pours. The corrugated ribs bond firmly with the concrete.

LABYRINTH WATERSTOPS are made of flexible polyvinyl plastic... that has superior weathering qualities, is not affected by temperature changes and chemical activity.

LABYRINTH WATERSTOPS are easy to work with, can be cut to any desired length. "L" and "T" joints can be welded with just a hot knife. Find out now how your costs can be cut... and end your seepage problems. Just mail the coupon to:

**WATER SEALS, inc.**  
9 SOUTH CLINTON STREET  
CHICAGO 6, ILLINOIS

Made in Canada for  
J. E. Goodman Sales Ltd.  
Toronto, Ontario

WATER SEALS, INC. DEPT. 3  
9 South Clinton Street  
Chicago 6, Illinois

Send full information and sample

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

For more facts, use coupon or circle No. 309

### Hand-powered stud driver has variety of uses

■ A new tool for driving studs into cement, brick, or soft iron, and which contains no cartridge or spring parts, is announced in the hand-powered Robot stud and nail driver imported from Germany by John K. Gieling.

The Robot, made of rugged, high-quality steel, is simply constructed and easy to operate, according to the distributor. Only five parts comprise the entire tool: the cylinder or housing with base seating plate, two jaws, and two springs.

The tool uses three interchangeable driving pins for 1/4-inch studs, 5/32-inch studs, and nails.

For further information write to John K. Gieling, 300 Fourth Ave., New



York 10, N. Y., or use the Request Card at page 18. Circle No. 114.

### Universal Atlas appoints assistant sales manager

William W. Burnham has been appointed assistant sales manager of the Philadelphia, Pa., sales territory of Universal Atlas Cement Co., New York, N. Y. He had formerly been with the Dayton, Ohio, sales office.

### MULLER MACHINES combine high quality with low price

Customers often express surprise that Muller Mixers and Power Trowels of such excellent quality can be sold for such low prices. There are four reasons: (1) long experience (46 years), (2) specialization, (3) best materials, (4) best distributors.



PLASTER and  
MORTAR MIXERS

Five sizes, 2 to 10 cu. ft. Electric or gasoline. Muller Lifetime Paddle Shaft Seal. Power throwouts on smaller models, disc clutch on larger. Rubber scraper blades optional.



CONCRETE MIXERS

Three models, 3 to 6 cu. ft., tilting type. Ample drums, fast mixing action. Timken Bearings, electrically welded construction. Electric or gasoline.

4 BLADED POWER TROWELS—Sizes 24", 29", 34" and 44" dia., B & S Engines. Stationary guide ring. Clutch and speed controls on handle.

Ask for prices and name of local dealer. You will be agreeably surprised with Muller's low prices.

**MULLER MACHINERY COMPANY, Inc.**  
Metuchen 15, N.J.  
Cable Address MULMIX

For more facts, use Reader-Reply Card opposite page 18 and circle No. 310

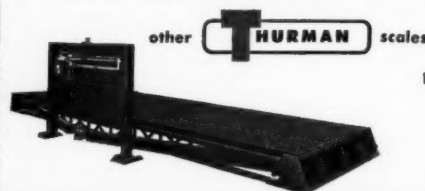
## ACCURATE PORTABLE WEIGHING

### THURMAN PROVED EASIEST Truck Scale to move!



**NO CONCRETE PITS NEEDED!** Thurman Portable Truck Scales maintain their accuracy under the most rugged conditions. These scales move from job to job easily... set-up in minutes. Ramp earth at each end, lets truck move into position. Proven by on-the-job performance and accuracy with hundreds of contracting firms. Write today for bulletin 601. Capacities: 20 to 50 ton. Deck Lengths: 18 to 43 ft.

can also be installed as a PITLESS SCALE—saves on expensive pit costs



other THURMAN scales  
Batching Scales  
Liquid Weighing Scales  
Portable Truck Scales  
Industrial Scales  
Pit Scales  
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Electronic Scales

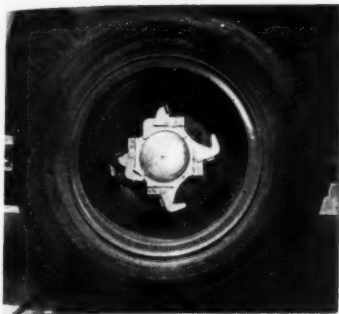
### THURMAN Precision Products since 1918

THURMAN MACHINE COMPANY, DEPT. O, 156 N. 5th STREET, COLUMBUS, OHIO

For more facts, use Reader-Reply Card opposite page 18 and circle No. 311

CONTRACTORS AND ENGINEERS

## Announce new automatic back-up alarm for trucks



■ The manufacture of a new, completely automatic, mechanical safety back-up alarm for trucks is announced by E. D. Bullard Co. This alarm, designed by two contractors' mechanics and further developed by

Bullard, is operated entirely by gravity. No wires or switches are needed.

The new back-up alarm is a self-contained unit, easily attached directly to the rear wheels of all dual-wheel vehicles with full-floating axles. It rests directly on the heads of the bolts which hold the axle in place. Mounted on the outside on left and right rear wheels, the alarm rings loud and clear, warning anyone behind the truck of approaching danger.

The unit consists of a 6-inch metal bell mounted on a steel plate, which is installed on the axle hub of the vehicle wheels. It is sounded by four heavy metal hammers striking the bell once every quarter revolution when the wheel is in reverse motion.

When the vehicle is moving forward there is no sound, as the hammers fall against rubber stops and remain in that position, held by centrifugal force.

Mounting of the Bullard back-up alarm is accomplished by the use of two cap screws passing through the rear mounting plate and fastening into the threaded holes usually present in all full-floating axle flanges.

For further information write to the E. D. Bullard Co., 275 Eighth St., San Francisco 3, Calif., or use the Request Card at page 18. Circle No. 77.

## Waterproofing concrete

■ Rapid-Flo, a non-toxic non-reactive powder which waterproofs concrete, is described in a bulletin from the Lambert Corp. With four ounces of Rapid-Flo added to a bag of cement, the cement is broken into finer particles and more cement comes in contact with the water. This, the bulletin claims, results in a complete mixture and perfect bonding with other components of the mix.

To obtain the folder write to the Lambert Corp., 1818 Weber St., Houston, Texas, or use the Request Card at page 18. Circle No. 49.

## Seismograph service

■ A Seismolog rental and record-analysis service is detailed in a folder from Vibration Measurement Engineers. The person renting the unit conducts the field tests, then returns the camera to the company. The company, the folder points out, then processes, analyzes, and evaluates the record, and mails a report. A picture of the Seismolog is accompanied by specifications.

To obtain the folder write to Vibration Measurement Engineers, 7665 Sheridan Road, Chicago 26, Ill., or use the Request Card at page 18. Circle No. 67.

## Symons opens new West Coast plant

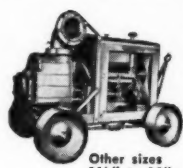
A new plant for the production of concrete-forming equipment, opened at San Leandro, Calif., by Symons Clamp & Mfg. Co., marks a major expansion of West Coast operations for the firm.

Located at 683 Thornton St., the plant has 12,000 square feet of space, and an additional half-acre of property for a rail spur and storage facilities for the company's line of shores and column clamps.

Joseph Von Drasek, vice president in charge of the factory is being assisted in sales by Richard G. Allen. Robert P. Tross has been transferred from Symons' Chicago, Ill., headquarters to act as chief engineer.



## This Jaeger pumps all the water a 2" hose can handle



Other sizes 1 1/2" to 10"

Hi-performance Jaeger Model 2PN will actually pump all the water that can be pulled through a 2" suction line under average working conditions. Delivers 10,000 gph when operating at only 2400 to 2550 rpm (as much as 400 rpm below the speeds of similar ordinary pumps). Weighs only 160 lbs. on base, 190 lbs. on pneumatics. For complete information on this model or other Jaeger pumps, see your Jaeger distributor or send for Catalog P-4.

### THE JAEGER MACHINE COMPANY

701 Dublin Avenue  
Columbus 16, Ohio

LOADERS • COMPRESSORS • MIXERS • PAVING MACHINES  
For more facts, use Reader-Reply Card opposite page 18 and circle No. 312

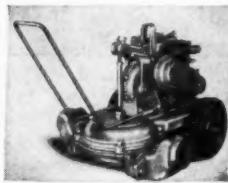
## For greater performance . . . lower costs . . . day in and day out . . . it's



CMC JOB MIXERS are the biggest money makers in the mixer field. 3 1/2 to 16 cubic foot models. WRITE FOR CATALOG!



CMC's large variety of types and sizes of pumps—assure lower cost water handling on any construction job! At left, 10" Dual Primer; at right, SKWEE-GEE diaphragm.

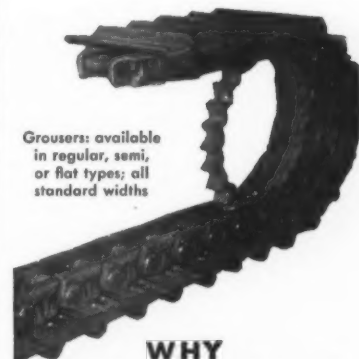


Dollar for dollar—feature for feature—CMC construction equipment is your BEST buy! It's backed by close to half a century of manufacturing experience and know how. If you're looking for BIGGER PROFITS—then you're looking for CMC! CONSTRUCTION MACHINERY COMPANY, Waterloo, Iowa.

### A COMPLETE LINE OF AMERICA'S FINEST

- **TRUCK MIXERS**  
4 sizes—3 1/2 to 7-yard capacities
- **BUILDING MIXERS**  
from 3 1/2 to 165
- **CENTRAL PLANT MIXERS**—from 165 to 845
- **PLASTER AND MORTAR MIXERS**  
from 3 1/2 to 12 cubic feet
- **PUMPS**—Dual Primers from 1" to 10", diaphragms, others.
- **HOISTS**—Many models. Single, multiple drums to 45 H.P.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 313



Grousers: available in regular, semi, or flat types; all standard widths

## WHY Kensington track LASTS SO LONG

There are two reasons why these tracks give you longer service, even under severest working conditions: (1) KENSINGTON's new, improved design, and (2) superior, wear-resisting alloyed manganese steel.

**New Design.** Rigidity and near-perfect alignment are made possible by one-piece rail design and special heat-treated alloy pins pressed tightly in place under high pressure. Anti-shear lugs on grouser plate fit snugly over tie bar of link to eliminate loose plates, elongated bolt holes, twisting, weaving, and side-sway . . . the most common causes of bolt loosening and track trouble. Grousers are heavy-duty at all critical points to better resist bending and breaking.

Yet, despite all these improvements, KENSINGTON Track Assemblies fit all standard, popular make crawler tractors.

**Steel with Stamina.** Special, hard, tough, KENSINGTON-developed alloyed manganese steels actually fight back against wear! They constantly develop extra surface hardness when exposed to friction, abrasion, and impact.

KENSINGTON tracks come from the factory ready-assembled, easy to install.

**Discover** for yourself how much KENSINGTON tracks will lower your maintenance costs and improve your operating efficiency. Coupon will bring details.



**Kensington**

STEEL COMPANY

SUBSIDIARY OF POOR & CO., CHICAGO

**KENSINGTON STEEL CO.**

Dept. A, 505 Kensington Ave., Chicago 28, Ill.

Please send information on crawler tracks for tractor described below. I understand I will be under no obligation.

Make of tractor \_\_\_\_\_

Model \_\_\_\_\_ No. links per belt \_\_\_\_\_

Width of grouser \_\_\_\_\_

NAME \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ ZONE \_\_\_\_\_

STATE \_\_\_\_\_

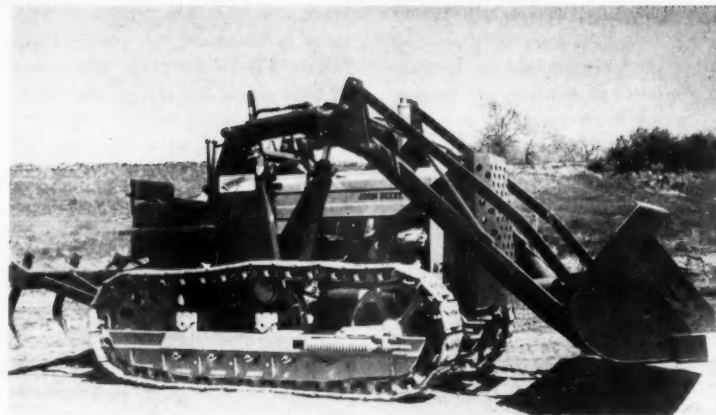
For more facts, use coupon or circle No. 314

## Tractor shovel features automatic self-leveling

■ Designed for use with John Deere Models 420 and 40 crawler tractors is the TS-40F tractor shovel made by Henry Mfg. Co., Inc. The shovel reportedly will raise 3,000 pounds to full height and has a 5,000-pound break-away capacity.

Special features of the Henry TS-40F include a self-leveling bucket; double-acting lift cylinders 3½ inches in diameter; solid steel lift arms 1½ inches thick; large, parallel circuit valves; and a full-flow oil filter. The steel main frame serves as the oil reservoir.

The manufacturer states that the automatic self-leveling bucket enables the operator to handle all heavy-duty



The Henry TS-40F shovel mounts on John Deere Models 240 and 40 crawler tractors.

loading and shoveling jobs with speed and economy.

For further information write to

Henry Mfg. Co., Inc., 1700 N. Clay, Topeka, Kans., or use the Request Card at page 18. Circle No. 162.



## Hammer Life Increased 7 Times by HARD-FACING

Hammers used to crush limestone and shale remain in operation for 70 weeks now that they are protected with HASCROME high-chromium rod. Unprotected hammers are completely unserviceable after operating for only 10 weeks under the same conditions. The usual maintenance procedure is to recondition the hammers with HASCROME rod about every two weeks—after they have crushed approximately 13,000 tons.

Hard-facing proved to be the economical solution to this typical problem of severe impact and wear. Periodic rebuilding with inexpensive HASCROME iron-base rod resulted in one hammer doing the work of seven, thus saving the cost of six new hammers.

HASCROME rod is widely used to protect rock crushing

and earth moving equipment because of its resistance to severe shock and impact. It is a tough alloy which work-hardens to Rockwell C-50, and doesn't chip or spall under heavy impact. The ability to resist mushrooming makes HASCROME rod an excellent build-up rod, too. It provides an excellent shock-proof base for harder, more corrosion-resistant HAYNES hard-facing alloys when severe abrasion or corrosion is the major problem.

See your local dealer for more information on the complete line of 18 HAYNES hard-facing alloys. One of them will solve your wear problem. If you don't know the location of your dealer, write to Haynes Stellite Company, a Division of Union Carbide and Carbon Corporation, Kokomo, Indiana.

See...

or

Write...

Your local Haynes Stellite Dealer

to Haynes Stellite Company

"Haynes" and "Hascrome" are registered trade-marks of Union Carbide and Carbon Corporation.

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 315

## Hydraulic oil filter

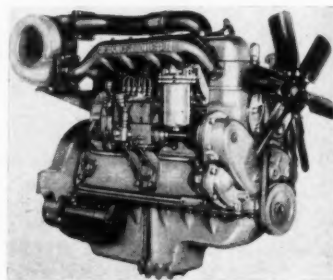
■ Marvel Engineering Co.'s synclinal filters for hydraulic oils, coolants, and lubricants are described in a catalog from the company. Diagrammatic pictures of the filter parts accompany discussions of the types of filters. Dimensional and engineering-data charts contain information on each filter. The actual mesh size is pictured, and a theoretical flow and pressure-drop table and ASTM standard viscosity-temperature charts are included in the catalog.

To obtain Catalog No. 107 write to Marvel Engineering Co., 7227 N. Hamilton Ave., Chicago 45, Ill., or use the Request Card at page 18. Circle No. 53.

## Turbocharged diesels are compact power units

■ Three series of turbocharged diesel power plants are available from the Hercules Motors Corp. They are recommended for use in generator sets and other specialized equipment requiring compact power units.

The TCD-501 has six cylinders, a 4½-inch bore, and a 5¼-inch stroke.



The TCD-501 produces 178 horsepower at 2,000 rpm. Its turbocharger may be positioned to fit particular applications.

It produces 178 horsepower at 2,000 rpm. The turbocharger may be positioned to fit particular applications.

The TCD-895 is also a 6-cylinder engine, but with a 5½-inch bore and a 6-inch stroke. It develops 320 horsepower and 2,000 rpm, and its turbocharger may also be moved around for particular applications.

The TCD-1468 is a V-type model with eight cylinders. It has a 6¼-inch bore and a 6-inch stroke. At 2,000 rpm, it develops 520 horsepower. The turbocharger is located in the V.

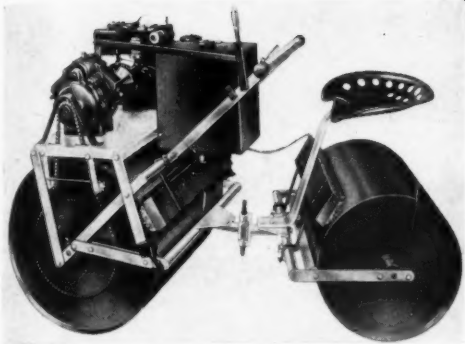
For further information write to the Hercules Motors Corp., Market and E. 11th St., Canton, Ohio, or use the Request Card at page 18. Circle No. 105.

## Line of oil cleaners

■ The WC and WH Series of oil cleaners is pictured and described in a folder from W. G. B. Oil Clarifier, Inc. The folder states the oil cleaners are for diesel-operated trucks, tractors, and engines. Three basic types of filters shown are the replacement filter, the fine-mesh screen bottom filter with center tube, and the can-type cartridge for center-tube filters.

To obtain Form 52-3 write to W. G. B. Oil Clarifier, Inc., Cornell and Ten Broeck, Kingston, N. Y., or use the Request Card at page 18. Circle No. 68.

CONTRACTORS AND ENGINEERS



The Moto-Roll 1/2-ton tandem roller is recommended as a replacement for hand tamping in small, confined areas.

### Tandem roller designed to handle tamping jobs

A series of power rollers has been added to the equipment manufactured by the Midland Products Co. Included in the new Moto-Roll line is a 1/2-ton tandem model said to provide economy, speed, and efficiency on smaller asphalt-paving jobs.

Produced primarily for the smaller contractor, the rig is also recommended for use by larger contractors on a limited-service basis. According to the manufacturer, use of the compact maneuverable machine all but eliminates costly, inefficient hand tamping of confined areas. The roller can follow right behind the rakes; there is no waiting period required while the asphalt sets, the company reports.

The compaction provided is said to be adequate to compress the lift without squeezing toward the edges. The forward-reverse transmission gives an equal speed ratio in both directions. Coupled dead center of both axles, the guide and compaction roller track each other, eliminating lap marks.

For further information write to the Midland Products Co., 181 Greenwood Ave., Midland Park, N. J., or use the Request Card at page 18. Circle No. 158.

### Portable water coolers

Water Boy portable water coolers, manufactured by Schlueter Mfg. Co., are described in available literature. A diagrammatic picture points out that all the coolers have a Sparkleen liner that is non-toxic, and odor and taste-free. According to the literature, the coolers are available in 2, 3, 5, and 10-gallon sizes, with or without faucets and handles.

To obtain the literature write to Schlueter Mfg. Co., 4616 N. Broadway, St. Louis 7, Mo., or use the Request Card at page 18. Circle No. 61.

### Portable air compressor

The Pneumatractor, a combination air compressor and tractor, is described in a catalog from Schramm, Inc. With a delivery of 125 cfm compressed air at 100 psi, the unit can be used to power pneumatic tools, paving breakers, drills, and sump pumps, according to the folder.

To obtain Catalog 5545 write to Schramm, Inc., West Chester, Pa., or use the Request Card at page 18. Circle No. 63.

"Hey you! Shut off that rock 'n' roll music."

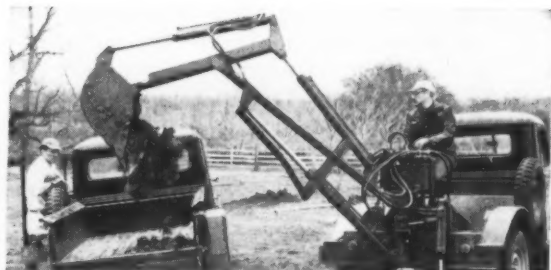


**Goes anywhere!** The Universal 'Jeep' is often the first equipment to reach a construction job, and the last to leave. With the extra traction of its 4-wheel drive, it takes engineers over the roughest ground for first surveys. During construction it carries men and tools wherever they are needed, on or off the road. And when the job is done, it helps speed final inspection work.

## How 4-wheel drive 'Jeep' vehicles help contractors save time and money!



'Jeep' with hoist lowers lighting equipment in a bridge deck installation. Because of its light weight, the 'Jeep' can haul materials over new concrete before it is strong enough to support heavy trucks.



'Jeep' Truck with hydraulically-operated back hoe prepares foundations, digs laterals or drainage ditches, and does other jobs too big for hand digging but too small for heavy-duty earth-moving equipment!

Vehicles in the 'Jeep' family help speed work and cut costs in almost every phase of construction.

In 4-wheel drive they go up steep grades—through mud, sand and soft earth—where other vehicles can't go. They shift easily into 2-wheel drive for travel at highway speeds. With power take-off or hydraulic lift, they operate many types of equipment from dozer blades to mobile drills for soil sampling. They stand up to the toughest usage—save your valuable time on job after job. Ask your nearest Willys dealer for an on-the-job demonstration or write for information.

## The 'Jeep'

family of 4-wheel drive vehicles

WILLYS...makers of the world's most useful vehicles

WILLYS MOTORS, INC., TOLEDO 1, OHIO

For more facts, use Reader-Reply Card opposite page 18 and circle No. 316



## Welded arch ribs span elliptical dome arena

Girders are being placed in pairs at each quarter point of the dome and braced with 8 and 10-inch purlins that will support precast-concrete slabs. Guy wires, used to stabilize the center column, will then be removed.



**"We've Sold Barnes Pumps for 28 Years  
— They've Got To Be Good!"**

E. L. HUEBNER, HUEBNER MACHINE & SUPPLY CO.  
CONSTRUCTION AND INDUSTRIAL MACHINERY AND SUPPLIES, SAGINAW, MICHIGAN

"When you continue to sell one line of pumps for 28 years and see customer acceptance of Barnes Pumps grow steadily year-after-year—when old customers come back for another Barnes Pump and new customers ask for Barnes Pumps—you can be sure that you are handling the best pump made.

"The courteous treatment that Barnes has always extended to us and our customers, plus the fine satisfactory performance of Barnes Pumps, certainly indicates that Barnes Pumps are the best and Barnes, as a company, is the best too."

*E. L. Huebner*

**HOW LONG IS 28 YEARS?** — Mr. Huebner will tell you that it's long enough (and then some) to forcefully demonstrate the worth of any product. Because of his long experience with Barnes Pumps, Mr. Huebner knows that when he recommends a Barnes Pump, he is offering unmatched dependability and performance and not once has a Barnes Pump fallen short of his recommendation—a fact that can serve you well in selecting a pump for your needs. And remember, Barnes has a pump for your specific job—at a price you planned to pay!

In addition to Engine and Motor Drives, Barnes Furnishes Pulley Driven Pumps — from 1½- to 6-in. Suction and Discharge Sizes.

**BUY THE BEST . . . BUY BARNES SELF-PRIMING CENTRIFUGAL PUMPS**

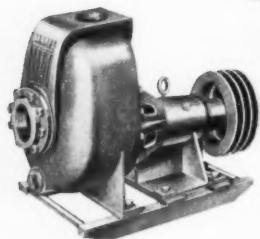
3,000 to 90,000 GPH — GASOLINE, DIESEL, ELECTRIC OR PULLEY DRIVES

**BARNES MANUFACTURING CO.**

Mansfield, Ohio • Oakland 21, Calif.

Write Dept. B-96 for details!

*forward action in '56*



For more facts, use Reader-Reply Card opposite page 18 and circle No. 317

An elliptical dome, measuring 270 feet in diameter and consisting of 32 welded steel-rib girders has been completed for the Alexander Memorial Center in Atlanta, Ga. Located on the grounds of Georgia Institute of Technology, the new Center will be used as a basketball arena.

Work began in May, 1955, when Mion Construction Co., Inc., Atlanta, was awarded a \$1,500,000 contract to construct the arena and an adjoining building to house the school's radio station and locker and shower rooms. The building and the dome are connected by an enclosed corridor providing access for the players from the basketball court to the showers.

### Girder ribs reinforced

Mion subcontracted the fabrication and erection of the arch ribs to Calvert Iron Works, Inc., Atlanta. Spanning 130 feet, the ribs were connected at the top of the dome to a circular girder 10 feet in diameter. The elliptical girders, consisting of a web plate and two flange plates, were reinforced with structural bulb tees as stiffeners. Delivered to the site in two sections, which were welded together on the ground, each rib varied in depth from 4½ feet near the bottom pin support to 3 feet near the connection with the top ring girder.

Before starting girder work, Calvert erected a 14-inch column on a concrete footing and guyed it to the anchor bolts of girder base plates. The circular girder was then placed and supported on the temporary erection column, which was at the exact center of the dome. This ring girder, which was incorporated into the dome, is 10 feet in diameter and consists of a 1½-inch-thick and 32¾-inch-deep web plate and two 16-inch wide-flange plates 2 inches thick.

A total of 32 plates, each ¾ inch thick, 10 inches wide, and 2 feet 8 inches long, were welded around the circumference of the bottom flange. These protruding strips formed the bolted and welded connection and support with the bottom flange of the arched plate girders. Thirty-two pairs of angle steel were bolted around the web of the ring girder to form a connection with the web of the arch ribs. The top flange of the arch ribs was longer than the bottom flange so that it might be slipped over and onto the

**Elliptical girders, of web plate and two flange plates, are tilted into place for 270-foot diameter dome**



The 32 welded steel-rib girders for the 270-foot-diameter elliptical dome of the Alexander Memorial Center's basketball arena are all in place. The 38-foot-diameter steel cupola atop the main dome will house ventilating fans.

C&E Staff Photo

top flange of the ring girder. This connection was then welded.

Calvert used two Lorain Moto-Cranes, one with a 75-foot boom and the other with a 60-foot boom, to place the ribs. To lift a girder into position, one crane made a bridge connection at a point one-third of the way from the top of the girder, while the second crane made another connection a third of the way from the other end. The first connection, a pin



Two Lorain Moto-Cranes place a 10-foot-diameter ring girder to form a rigid connection at the top of the dome.

connection at the base of the girder, consisted of a base plate anchored by four 2-inch-diameter bolts, and two steel channels placed back-to-back on the base plate. A 3 3/4-inch-diameter steel pin connected the rib to the base plate channels.

The upper connection to the circular girder was accomplished after hinged connections had been made. Girders were first placed in pairs at each quarter point of the circular structure and braced together with 8 and 10-inch purlins placed on 8-foot centers along the upper flange of the ribs. The guy wires were then removed from the center erection column.

Steel bulb tees, 33 inches apart, were welded to the purlins to support 33 x 96 x 2-inch-thick Porex wood-fiber precast-concrete slabs. Manufactured by Concrete Products, Inc., Brunswick, Ga., the slabs are topped with a 1/2-inch cement finish. A 40-

(Concluded on next page, col. 4)

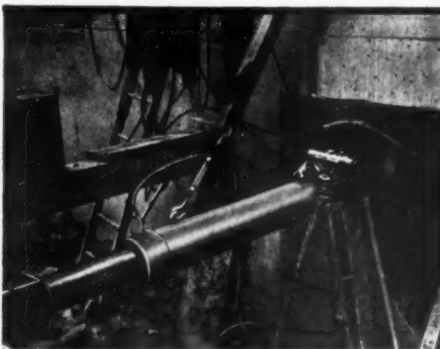
## MUSCLES under the mainline!

### Rodgers Hydraulic Jacks

**push three 88 foot tiles under railroad without disrupting traffic**

Two 200 Ton Rodgers Hydraulic Jacks were selected by W. J. Irwin & Sons, Inc., Tonawanda, N. Y. for driving three sewer pipes of 96" I. D. reinforced concrete tile 88' under the mainline of the New York Central Railroad. Part of a 2 1/2 million dollar sewer contract on the Tonawanda West Side Drainage Project, the "push pipe" method was preferred because it permitted unrestricted use of the rail right-of-way overhead.

**TIME: 34 DAYS**—Actual jacking time consumed 34 days based on three-eight hour shifts a day. Each sewer took eleven 8-foot tile sections. The *First Line* required 14 days; the *Second Line* 11 days and the *Third* only 9 days.



**JACKING PROCEDURE**—A service pit 28' deep by 22' wide by 40' long was excavated to house the jacking equipment. A pair of 75 lb. steel rails placed on the concrete pit floor cradled the tile sections and acted as a guide for the jacking operation. Type of soil encountered in all three pipes was a mixture of heavy yellow and blue clay.

**EQUIPMENT USED**—Two 200 Ton Rodgers Hydraulic Jacks with 48" ram travel were powered by a Rodgers Model D2 electric driven hydraulic pump located at the top of the excavation pit. A valve panel located at the bottom of the pit permitted accurate control of the jacking operation.



Steel rails cradle tile sections as twin Rodgers Jacking Cylinders press against the wooden jacking frame. Heavy grease on outside of tile cuts down friction—for easier sliding.

Rear of excavation pit showing Hydraulic Jack against abutment wall. At this stage the ram is extended approximately 1/5 of the 48" ram travel.

**ADVANTAGES OF HYDRAULIC JACKING**—This job was handled at low cost and was unique due to the short time required for completion and the fact that rail service overhead continued uninterrupted throughout the tunneling project below. Entirely different from conventional tunneling, the "push pipe" method also provides greater safety to workers from cave-ins since they work inside the tile that is being driven.

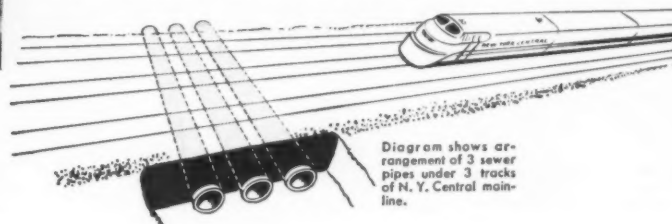


Diagram shows arrangement of 3 sewer pipes under 3 tracks of N.Y. Central mainline.

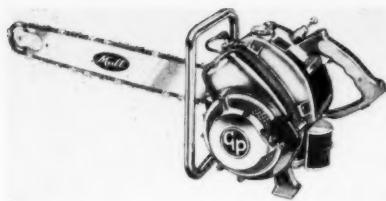
If you'd like more details about this job, write for free copy of Bulletin 331.

**Rodgers Hydraulic Inc.**

7415 Walker St. • Minneapolis 16, Minnesota



For more facts, use Reader-Reply Card opposite page 18 and circle No. 318



The Mall GP chain saw weighs 26 pounds and has a 3,000-fpm chain speed.

### Chain speed of 3,000 fpm feature of new power saw

■ The new GP (general purpose) chain saw manufactured by the Mall Tool Co. has direct drive, a 3,000-fpm chain speed, an overspeed-controller on the engine, and an adjustable, fixed-jet carburetor that will operate in any position, according to the company.

Weighing 26 pounds with an 18-inch bar and chain, the new saw uses

the Mall "contoured-teeth" router chain, said to increase its effectiveness by 35 per cent. The GP's engine delivers maximum torque and work power at 5,000 rpm.

For further information write to the Mall Tool Co., 7725 S. Chicago Ave., Chicago 19, Ill., or use the Request Card that is bound in at page 18. Circle No. 122.

### Automatic curb layer

■ The Stephens-Canfield automatic curb-laying machine is described in a bulletin from E. L. Hardin Associates, Inc. The bulletin states that the self-propelled unit uses asphaltic or portland-cement concrete, and travels at a rate of 7½ fpm. Three men operate the unit and, according to the bulletin, up to 1,800 feet have been laid in a normal working day. Operating and maintenance instructions, specifications, and job photos and reports are included in the descriptive bulletin.

To obtain the bulletin write to E. L. Hardin Associates, Inc., P. O. Box 439, Salisbury, N. C., or use the Request Card that is bound in at page 18. Circle No. 42.

(Continued from preceding page)

### Circular foundation

Supporting the 32 plate girders is a circular reinforced-concrete foundation, which also doubles as a 7-foot-square exhaust tunnel. The top slab, 9 feet wide and 9 inches thick, has 22 1¼-inch-square-reinforcing bars throughout its base. Where vertical walls are supported on piles, they are 9 inches thick; walls on spread footings are 8 inches thick. The base foundation required 63 10-inch piles, 20 to 35 feet long, which were driven to refusal by a steam hammer. Spread footings under each arch rib are 1 foot 6 inches thick, 8 feet wide, and 4 feet long.

The contractor excavated 25 feet below the pin connection of the ribs in order to reach the designed level of the basketball court, 75 feet below the top of the dome. The fill was inclined from the top of the foundation slab to the court level to support the circular concrete seating bank, which accommodates 7,000 people. The court itself consists of a 5-inch-thick circular concrete slab 131 feet 6 inches in diameter topped by a maple-wood playing floor.

An exhaust intake 1 foot 10 inches high, running around the circumference of the court, removes stale air from that level. Air passes through the intake from the court into a circumferential tunnel measuring 4 feet 8 inches high and 3 feet wide. Reinforced-concrete slabs 8 inches thick form the floor, walls, and roof of the tunnel, which is embedded in the inclined fill supporting the seating bank. Fourteen concrete sewer pipes, 3 feet in diameter and spaced at equal distances, are connected to the tunnel and remove the exhaust air to the upper 7-foot-square tunnel lying under the arch supports.

A 38-foot-diameter ribbed-dome cupola on the top of the main dome will also carry exhaust. Stale air is finally removed from the upper tunnel by seven fans, equally spaced around the circumference, each having minimum and maximum capacities of 18,000 cfm and 36,000 cfm, respectively.

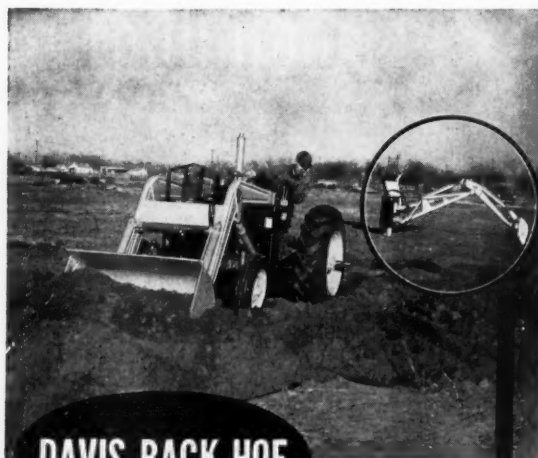
The arena is heated by unit heaters suspended over the seating bank. The warm air is forced down to the seats and playing court by the draft set up by the exhaust intake at the court level.

### Personnel

C. E. Samford is the superintendent for Mion Construction Co., and Ralph Walden is the superintendent for Calvert Iron Works. Aeck Associates, Atlanta, was the architect. Morris, Boehmig & Tindel, D. F. Lindstrom & Associates, and Charles F. Howe, all of Atlanta, served as structural, mechanical, and electrical engineers, respectively.

THE END

CONTRACTORS AND ENGINEERS



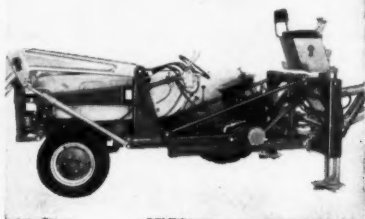
DAVIS BACK-HOE

## Detaches in 5 Minutes

Compare the Davis Back-hoe and you'll see why you can accomplish more with less fatigue than with any other back-hoe. That's because it works at right angles...digs as deep as 13'...lets you sit comfortably...see exactly where you're digging...and face the direction of your work. But that's not all! It detaches in five minutes so that you can use your tractor for other work or with Davis Loader alone. It forms its own rigid tripod, and when you want to use the back-hoe again, you connect it up just as fast. You make more money; yet you actually pay less for the Davis Back-hoe and the Davis Loader with their many long-lasting features. See them today!

### DAVIS LOADER AND BACK-HOE FORM CRADLE AROUND TRACTOR

Even though the Davis Back-hoe uncouples in minutes, it fits as rigidly to the Davis Loader as if it were welded on. The two units form a sturdy frame that "cradles" the tractor, absorbing stress and strain when digging or going over rough terrain.



SOLD AND SERVICED NATIONWIDE BY BETTER DEALERS

Mid-Western Industries, Inc.  
1009 South West Street  
Dept. B, Wichita, Kansas

Please send me literature and name of dealer on Davis Loader ☐ Davis Back-hoe ☐

to fit a.....tractor.  
(Please Print)

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ADDRESS.....

TOWN.....STATE.....

For more facts, use coupon or circle No. 319

**Eliminate STEP CUTTING**

**ONE BLADE ONE PASS ONE WIDTH**

**cut costs 50%**

**with carbide bonded blades**

The new Carbide Bonded blade cuts a clean, constant width, easy to seal joint in one pass. Although field reports show Carbide blades last 2 to 3 times longer than all ordinary diamond blades, the cut virtually remains the same width throughout the life of the blade.

Write today for full information and prices.

**Consolidated DIAMOND TOOL CORP.**  
320 Yonkers Avenue, Yonkers, N. Y.  
\*Patents Pending.

CONCRETE AND MASONRY CUTTING BLADE DIVISION

For more facts, circle No. 320

**LATEX CONCRETE TOPPING**

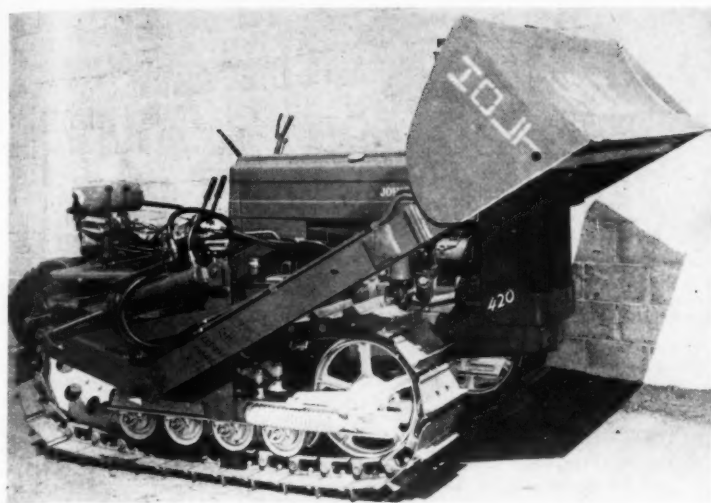
**NO CHIPPING — NO ROUGHENING — NO PRIMING — NO CURING —**

- The only concrete-color material that can be applied thin as 1/16" or more than 1" thick, as needed.
- Rough, pitted, trowel-marked, uneven or broken concrete and masonry can be made smooth with a thin coat of LATEX CONCRETE TOPPING — INDOORS OR OUT — the answer to those "frozen" or "rain-pitted" concrete surfaces!
- 52-lb. drum includes 40 lbs. of powder mix, 1 gallon Latex liquid. Covers 100 sq. feet, 1/16" thick.
- If your dealer cannot supply you, one unit delivered to you for \$10.50, 2 units \$18.00.

**The CAMP COMPANY, Inc.**  
6958 South State Street, Dept. CE-96  
Chicago 21, Illinois

**OVER 21 YEARS OF CONTINUOUS SERVICE**

For more facts, circle No. 321



◀ The Holt straight hydraulic-tilt dozer lifts 46 inches, tilts 9 inches, has a 76½ x 28-inch moldboard, and a 9-inch depth of cut.

#### Bulldozers announced for crawler tractor

■ Heavy-duty bulldozers designed for use with the John Deere Model 420 crawler tractors are announced by Holt Equipment, Inc. The new dozers are available in straight, angle, and straight hydraulic-tilt models.

The dozers utilize the Holt Cantilever side-arm construction principle for high lift. The angle dozer is angled or tilted through a mechanical linkage, while the straight hydraulic-tilt model uses hydraulic controls for blade tilting.

The angle dozer lifts 50 inches. It has a 90 x 26-inch moldboard and tilts 6 inches. The straight model lifts to a height of 42 inches and has a 76½ x 28-inch moldboard. The hydraulic unit lifts 46 inches, tilts 9 inches, and also has a 76½ x 28-inch moldboard. All models have a 9-inch depth of cut.

For further information write to Holt Equipment, Inc., Independence, Ore., or use the Request Card that is bound in at page 18, Circle No. 165.

#### Gyratory crushers

■ The Kue-Ken gyratory crusher produces finely crushed rock, according to a bulletin from the Pennsylvania Crusher Division of Bath Iron Works Corp. Construction design and outstanding features are detailed. Also included in the bulletin is a capacity table, and a table of weights, horsepower, and dimensions.

To obtain Bulletin 501 write to Pennsylvania Crusher Division, Bath Iron Works Corp., 323 S. Matlock St., West Chester, Pa., or use the Request Card at page 18. Circle No. 56.

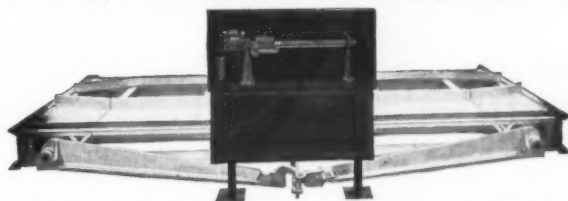
#### Line of dredges

■ The complete line of Ellicott dredges is described in a catalog. Dredging as a science is discussed, and the progress in dredge design is described and pictured. Also detailed are the six basic types of dredges. Action shots illustrate such applications as harbor improvement, canals and other waterway work, land fill, and flood control. Data is given on the firm's Dragon models and special dredging machinery.

To obtain Bulletin 860 write to Ellicott Machine Corp., 1611 Bush St., Baltimore 30, Md., or use the Request Card at page 18. Circle No. 36.

### WINSLOW—PORTABLE TRUCK SCALE

"THE CONTRACTORS' SPECIAL SCALE"



For use at temporary and permanent locations—at stock piles and by bituminous material contractors at the job site. Cap.: 15-18-20-30, 50 tons. Write us for name of your nearest distributor

**WINSLOW SCALE COMPANY**

P. O. Box 1198  
Terre Haute, Indiana

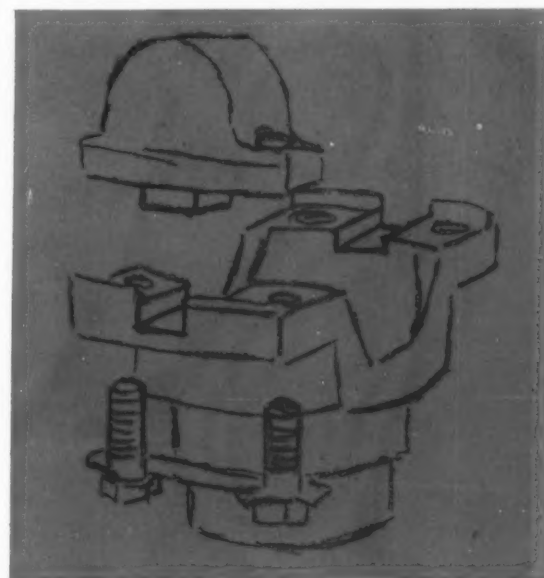
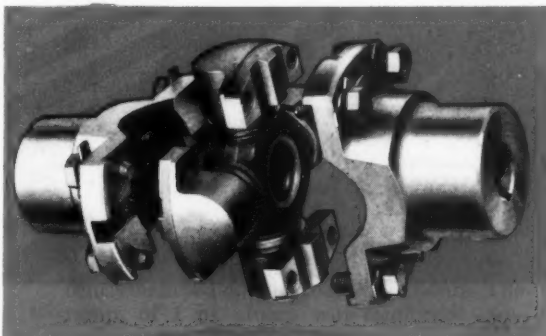
For more facts, use Reader-Reply Card opposite page 18 and circle No. 322

SPECIFY  
KEY-DRIVE  
JOINTS FOR

# FAST

ASSEMBLY  
AND SERVICE  
OPERATIONS

Unique features of MECHANICS Roller Bearing UNIVERSAL JOINTS make them unusually easy to install and service. The complete cross and bearing assembly can be removed simply by taking out the cap screws and separating the end yokes slightly. No flange is required for drive shaft connections. Accurately and durably built for long, heavy service, MECHANICS Roller Bearing UNIVERSAL JOINTS are inherently balanced for smooth operation.



Let our engineers show you how MECHANICS close-coupled Roller Bearing UNIVERSAL JOINTS conserve space and compensate for offset shafts, in your new and improved models.

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# UNIVERSAL JOINTS

For Cars • Trucks • Tractors • Farm Implements • Road Machinery •  
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For more facts, use Reader-Reply Card opposite page 18 and circle No. 323

## THE AMAZING HANCOCK 10 YARD ELEVATING SCRAPER



MOVES UP TO 200 YARDS OF EARTH PER HOUR, depending on the haul, at one third the normal cost. Yet you can own one for considerably less than the price of an ordinary scraper.

- self-loads, elevates, pulverizes the dirt and spreads it.
- cuts from 1/2 to 6 inches deep in any soil.
- works efficiently with any tractor of 75 HP or over.
- hydraulically controlled
- adjustable high clearance
- turns in only 28 feet.

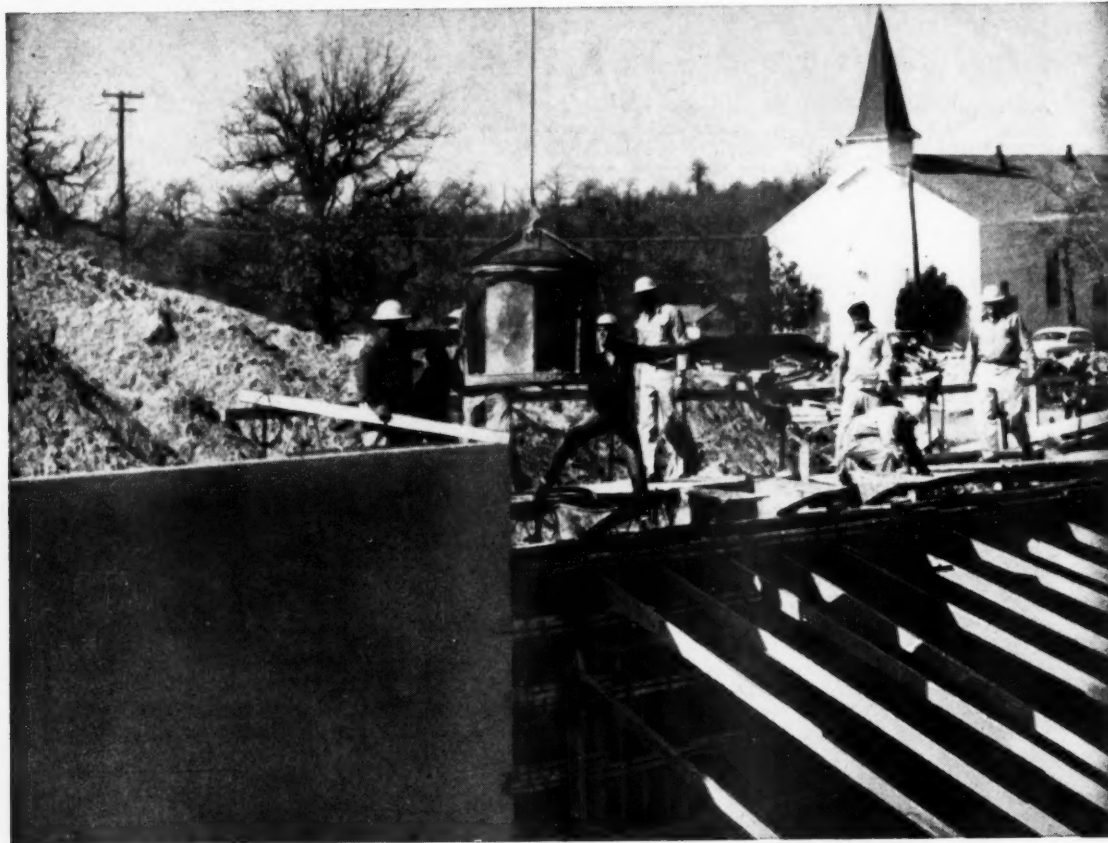
And there are other Hancock money savers. The agriculture series of elevating scrapers in 5 and 8 yard models. WRITE FOR INFORMATION.

**HANCOCK**  
MANUFACTURING CO.

Lubbock, Texas

For more facts, use Reader-Reply Card opposite page 18 and circle No. 324

## NOW...WHEN POURING CONCRETE— Drastically reduce costs of your plywood forms with SONNEBORN FORM-SAVER



### FORM-SAVER REDUCES COSTS. HERE'S WHY:

- Gives maximum protection of wood forms with a minimum of labor. Just brush it on or dip forms into it!
- Provides 8 to 10 re-uses from your forms before re-coating with Form-Saver!
- Produces clean, smooth concrete surfaces that show no wood grain . . . that require little, if any, rubbing except for fins and butt joints.
- Reduces painting costs. There are no oil stains to remove . . . paint goes further, is easier to apply due to smoothness of surfaces. Form-Saver helps reduce the cost of painting by as much as 25%!

Sonneborn Form-Saver is a fast-drying coating that deposits on plywood forms a water-impervious film resistant to the alkalinity produced by the hydration of portland cement.

For further information on Sonneborn Form-Saver FILL IN THE COUPON

A Product of **Sonneborn** RESEARCH

Makers of Lapidolith Concrete Hardener  
Hydrocide S-X Colorless • Hydrocide Dampproofings

L. SONNEBORN SONS, INC.  
Building Products Division—Dept. C-9  
404 Fourth Ave., New York 16, N. Y.

Gentlemen:

Yes, I would welcome a free copy of Technical Data Guide No. 48 on Sonneborn Form-Saver.

Architect ☐

Engineer ☐

Contractor ☐

Name.....

Company.....

Location.....

City.....State.....

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 325



An IHC-300 utility tractor equipped with an Arps Dual-Action dozer.

### New dozer blade sports double-acting cylinder

■ The Dual-Action dozer for the new International IHC-300 utility tractor has been announced by the Arps Corp., The unit gets its name from the double-acting hydraulic cylinder on the blade.

In combination with the I-H Hydra-Touch control valve, the hydraulic cylinder will afford enough positive down-pressure on the blade to permit penetration in hard and partially frozen soils, the manufacturer points out. With the new blade, the IHC-300 is recommended for removing topsoil and backfilling, grading, bulldozing, snow plowing, and shallow excavating.

There are five angular adjustments for the Arps blade so that it may serve either as a bulldozer or as an angledozer. In addition, there are three adjustments for the cutting pitch.

For further information write to the Arps Corp., New Holstein, Wis., or use the Request Card at page 18. Circle No. 12.

### New concrete vibrator has 1 3/8-inch head

■ A concrete vibrator with a 1 3/8-inch head diameter has been announced by Vibro Plus Products, Inc. The new head operates on the Rollgear principle, which converts motor speeds of 3,600 rpm into vibrator speeds of 12,000 vibrations per minute.

The entire line of Vibro Plus vibrators features interchangeability of power units. Electric, gasoline, or pneumatic power may be used. A snap-coupling between the shaft and the power source permits a change to be made quickly and without tools.

Vibrator heads run dry and need no lubrication. All vibrator shafts are prelubricated for 6 months' use without servicing.

For further information write to Vibro Plus Products, Inc., Stanhope, N. J., or use the Request Card at page 18. Circle No. 121.



The new Vibro Plus concrete vibrator has a 1 3/8-inch head and delivers 12,000 vibrations per minute at a motor speed of 3,600 rpm.

CONTRACTORS AND ENGINEERS



Plexiglas is used in place of safety glass in these shovel cabs.

### Plastic pane replaces safety glass in cabs

The replacement of safety glass on construction machinery with transparent Plexiglas is recommended by the Rohm & Haas Co. as a means of decreasing glass-breakage problems and the resulting replacement and downtime costs.

According to the manufacturer, the cost of 1/4-inch Plexiglas is comparable to that of conventional safety glazing. The transparent plastic, it is reported, stands up better than safety glass against the damages of rough service, flying stones, carelessly handled tools, and door slamming. Replacement is made as the safety panes are broken.

Plexiglas is said to be unaffected by weather, acids, alkalis, or corrosive chemicals. It can be washed with soapy water and a soft cloth.

For further information write to the Rohm & Haas Co., 206 W. Washington St., Philadelphia, Pa., or use the Request Card at page 18. Circle No. 163.

### Pallet, scaffold system

Dimensional drawings of West Brick Buggy's method of palletizing and scaffolding are contained in a manual. Data is given on palletized brick, block, headers, and tile; and on suspended and sectional scaffolding. The drawings also include five models of brick buggies manufactured by the company.

To obtain the manual write to West Brick Buggy Corp., 4310 Mayfield Road, Cleveland 21, Ohio, or use the Request Card at page 18. Circle No. 69.

### Water cans, coolers

Horton water cans and coolers are described in a mailing piece from the company. The cans and coolers are made of copper-alloy galvanized steel and are said to withstand abuse and to give maximum protection against leaks. The specification chart states that the cans and coolers are available in 1 1/2 to 15-gallon sizes.

To obtain the mailing piece write to the Horton Equipment Co., 1502 Maury St., Houston, Texas, or use the Request Card at page 18. Circle No. 43.

## Lick your snow problems with "ROSS" SNOW PLOWS

One-Way • V-Type • Reversible • For Trucks or Motor Graders



Burch-built "ROSS" Snow Plows are the leaders in their field.

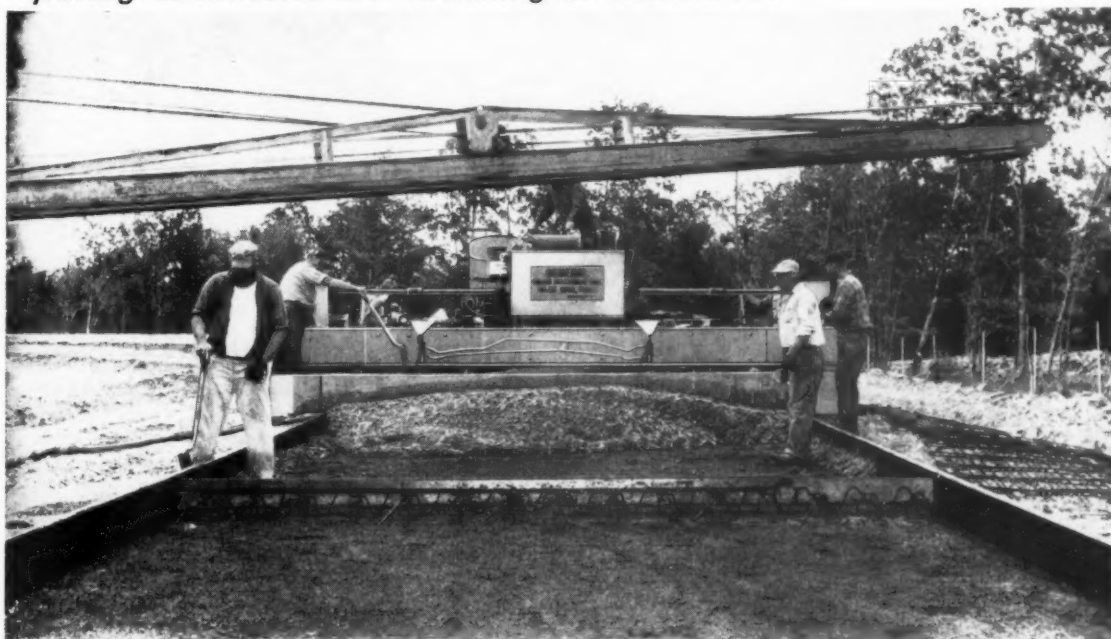
The exclusive "Sno-Flo" moldboards used on "ROSS" Snow Plows lift, roll and eject the snow rather than bulldozing it.

Write today to Dept. CE for literature.

**The BURCH Corporation**  
CRESTLINE, OHIO, U.S.A.  
MANUFACTURERS OF EQUIPMENT FOR CONSTRUCTION AND MAINTENANCE OF ROADS AND STREETS

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### paving contractors are switching to General...



General Model 5-S portable self-widening 12-18 ft. Finisher working on northeast extension of Pennsylvania Turnpike.

## GENERAL SELF-WIDENING FINISHER

*cuts interchange paving costs for J. Robert Bazley, Inc.*

Another leading contractor now using General Road Machines paving equipment is J. Robert Bazley, Inc., Pottsville, Penna.

They are using a GRM Model 5-S 12 to 18 ft. self-widening Finisher on the northeast extension of the Pennsylvania Turnpike.

Working on an interchange ramp with a dual-drum paver, the General Finisher recently handled 401 batches in 6 1/2 hours. The ramp, of 1 in. slump wire-reinforced concrete, tapered from 17 to 12 ft. in width. Super-elevation was 1 in. per ft.

On this difficult pour, the GRM Finisher struck off for mesh and made first and final finishing passes while adjusting in width

from 17 down to 12 ft. and negotiating the super-elevation. Completing this job in just 6 1/2 hours, the General machine operated at near the full capacity of the paver. Because of its cost-cutting speed, the contractor is now using this Finisher in place of another machine on straight-away paving on the Turnpike extension.

General machines can increase production and cut costs on your jobs. Ask your General Road Machines distributor for more information about this advanced design Finisher, available in widths up to 32 ft. It's a part of General's complete line of modern paving equipment.

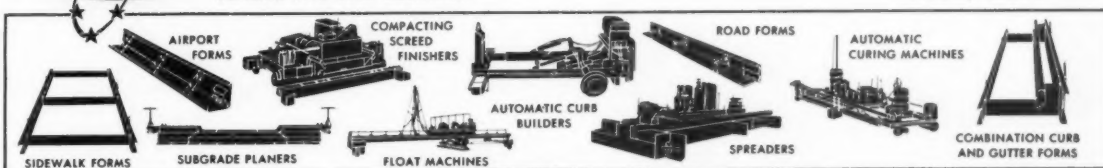
AA-3886



GENERAL ROAD MACHINES, INC.

GENERAL FIVE STAR EQUIPMENT

Niles, Ohio



For more facts, use Reader-Reply Card opposite page 18 and circle No. 327



Amsco's new S/A Manganese electrode is used to build up the lip of a worn backhoe bucket.

### New line of electrodes for semi-automatic welds

■ The American Manganese Steel Division of the American Brake Shoe Co. has announced a new line of tube rod electrodes especially developed for semiautomatic hardfacing. Although

the tube rods have been designed specifically for use with the Amsco MF semiautomatic machines, they are said to be easily adapted for use with most semiautomatic machines.

The new electrodes are 3/32-inch-diameter drawn tubular wire, and act much like mild steel solid wire in the welding machine. The tube rod is a perfectly round steel-wire shell with the various alloys firmly enclosed within the shell. The steel shell of the wire is work-hardened to prevent any deformation or snarling of the rod during welding.

The most important gains offered by the new electrodes are said to be high-metal deposition, longer wear life of parts, and speed and ease of welding. According to the manufacturer, extensive field tests with the new tube rods indicate a wear life at least 30 per cent longer than most manual electrodes used in similar applications. The tests involved dipper teeth, scraper blades, crusher parts,

tool joints, auger flights, and similar machine and tool elements.

At present, three electrodes are available: S/A Manganese, for all types of manganese steel buildup and repair applications; S/A 53, for general-purpose hardfacing; and S/A 33, for areas which require a high resistance to abrasion.

For further information write to American Manganese Steel Division, American Brake Shoe Co., 395 E. 14th St., Chicago Heights, Ill., or use the Request Card at page 18. Circle No. 84.

### Aerial mapping

■ Photogrammetry in the engineering field is detailed in a catalog from Jack Ammann Photogrammetric Engineers, Inc. The catalog states that photogrammetry, which is a combined effort of the pilot, surveyor, photographer, engineer, and cartographer, broadens the scope of surveying. The four types of maps pictured and described are the aerial photograph, the mosaic, the planimeter, and the topographic map.

To obtain the catalog write to Jack Ammann Photogrammetric Engineers, Inc., Broadway at Tenth, San Antonio 5, Texas, or use the Request Card at page 18. Circle No. 72.

### Gas-powered signal horn can be heard for 1/2 mile

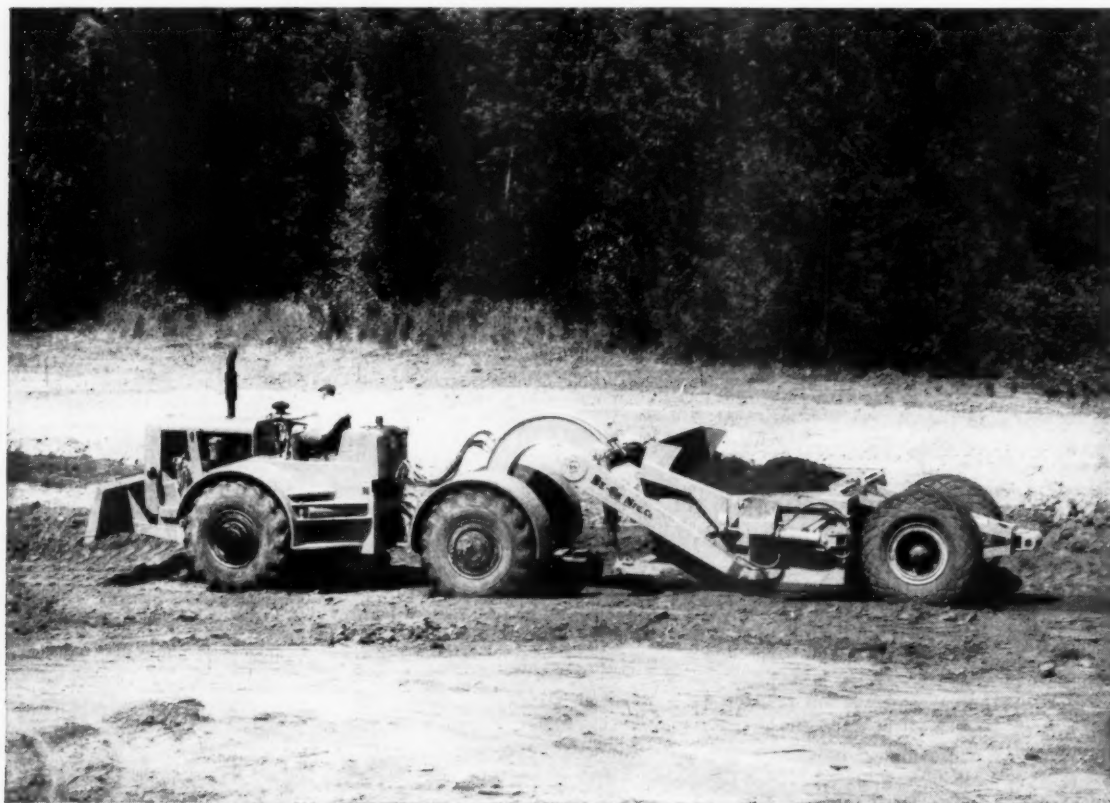
■ A portable, self-powered signal horn that can be heard for more than 1/2 mile over construction sites is available from Falcon Alarm Co., Inc. The Falcon Big Bertha is powered by carbon dioxide and provides a warning signal comparable to that of a diesel engine horn.

Sound output of the 40-pound Big Bertha is rated at from 116 to 122 decibels at a distance of 25 feet. It will produce approximately 250 5-second blasts before requiring recharging. The unit consists of a 15-pound steel cylinder of compressed carbon dioxide, a 13-inch-long horn, special diaphragm and valve assemblies, and a pressure gage. Over-all height is 31 inches.

For further information write to Falcon Alarm Co., Inc., 243 Broad St., Summit, N. J., or use the Request Card at page 18. Circle No. 4.



The Big Bertha signal horn, which can be heard for more than 1/2 mile, is powered by carbon dioxide and will produce about 250 5-second signal blasts without recharging.



Wagner Model IND-14 Tractor equipped with Fuller R-96 ROADRANGER Transmission.

## Wagner Earthmoving Tractors geared with FULLER semi-automatic TRANSMISSIONS

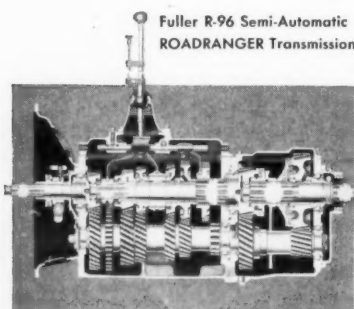
Sturdy Wagner IND-14 Tractors equipped with Fuller 10-speed R-96 Semi-Automatic ROADRANGER Transmissions handle tough construction

jobs. Above, a Wagner Tractor is shown pulling a Be-Ge Scraper, moving heavy loads with ease.

Easier shifting and faster acceleration are features that make Wagner Tractors equipped with Fuller Transmissions real time savers. The R-96 ROADRANGER makes work easier for engines of the 960 cubic inch class in off-highway construction applications

... the short, even steps between gear ratios keep the rpm in the maximum horsepower range.

There is no gear splitting ... the 10 selective ratios are evenly and progressively spaced, averaging short 28% steps. One shift lever controls all 10 forward speeds. Range shifts are pre-selected ... automatic and synchronized.



**FULLER MANUFACTURING COMPANY**  
Transmission Division, Kalamazoo, Michigan

Unit Drop Forge Division, Milwaukee 1, Wisconsin • Shuler Axle Company, Louisville, Kentucky (Subsidiary) • Sales & Service, All Products, Western District Branch, Oakland 6, California and Southwest District Office, Tulsa 3, Oklahoma.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 328



The 1956 Model of the Minn-Kota rock-picker has a hydraulically operated shovel loader for loading into trucks.

### New rock-picker features hydraulic truck loader

■ The 1956 model of the Minn-Kota rock-picker is available with a hydraulically operated shovel loader for loading into trucks or for high stacking. Conversion kits are available to add this new feature to older models of the rig.

The rock-picker is available in 8 and 6-foot width models. The frames of both sizes are constructed of 5-inch channel steel electrically welded. The tines are adjustable and may be spaced as close as 1½ inches apart. Fully hydraulic, the machine has two single and two double-acting cylinders. All controls are operated from the towing tractor's seat.

With the Hi-Unloader, the rock-picker loads into trucks or piles in high mounds. The "floating action" of the hopper box, plus an adjustable trip, permits accurate dumping of material.

For further information write to the Minn-Kota Mfg. Co., 201 N. 17th St., Moorhead, Minn., or use the Request Card at page 18. Circle No. 2.

### Torque tool manual

■ The general principles of torque tools and the methods of use are incorporated in the second edition of a Torque Manual published by P. A. Sturtevant Co. Tables show screw torque data and minimum torsional strength tabulations, torque and tension relationship for high-tensile and mild-steel screws, and torque conversion. Application formulas and illustrations are also included.

To obtain the manual write to P. A. Sturtevant Co., 333 W. First St., Elmhurst, Ill., or use the Request Card at page 18. Circle No. 145.

### Pipeline equipment

■ Construction and maintenance equipment for pipelines is described in a catalog from the M. J. Crose Mfg. Co., Inc. Machinery shown includes that for coating, wrapping, cleaning, and priming. Auger-type road boring units, pipeline kettles, cutters, and expanders are also described.

To obtain the catalog write to M. J. Crose Mfg. Co., Inc., 2715 Dawson Road, Tulsa, Okla., or use the Request Card at page 18. Circle No. 135.

### Manual on cold bending, cut-machining of metals

"A Manual of Processes for The Cold Bending of Metals and Abrasive Cut-Machining of Metals" has been published by Wallace Supplies Mfg. Co. The first two sections of the booklet describe the types of bending machines used for cold bending of tubes, pipe and structural shapes, the tools and designing for bending, and the theory of bending.

The remaining two sections are devoted to abrasive cut-machining of metals, and deal with such subjects as why abrasive wheels sometimes fail, how to prevent failure of abrasive wheels, speed in cutting, and the quality of cuts.

The 170-page book, liberally illus-

trated with photographs, graphs, and charts, is available from Wallace Supplies Mfg. Co., 1304 Diversey Parkway, Chicago 14, Ill., for \$2.50 per copy. The bending section may be had separately for \$2. The cutting section, also available separately, is priced at \$1.

### New Syntron sales group

The Syntron Co., Homer City, Pa., manufacturer of industrial vibratory handling equipment, has formed a new sales company in West Virginia. Located at 227½ Seventh St., South Charleston, the firm will cover West Virginia, Virginia, and Kentucky.

Wallace P. Smith has been named vice president in charge of the new organization.

# Ruggedness Built In Makes Wagner Stand Out



## "Torture Tested" Wagner Tractor Equipment

Gives Longer Life—Reduces Down-Time and Repair Cost

Rugged work requires rugged equipment and that's exactly what you get with Wagner "Torture Tested" tractor equipment. Every stress point is doubly protected. Heavy-duty construction keeps maintenance costs way down and productive time way up. Wagner equipment stays on the job day in and day out working for you and more profits. No wonder Wagner tractor equipment is recog-

nized as so far superior it has become No. 1 in America by a wide, wide margin. See all the rugged features of Wagner tractor equipment and the numerous attachments that can make a tractor your most versatile piece of equipment. Get proven dependability no matter how tough the job. Get Wagner tractor equipment today.



WAGNER IRON WORKS, 1905 South 1st St., Dept. 228  
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Send me more information on Wagner Tractor Equipment for a \_\_\_\_\_ tractor.  
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CITY \_\_\_\_\_ STATE \_\_\_\_\_

"WAGNER BUILT" MEANS "BETTER BUILT" FOR OVER 105 YEARS

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## KONKURE Concrete Curing Compounds



Spray application curing membranes for freshly finished concrete surfaces — meets all city, county, State and Federal specifications. Unexcelled concrete moisture retention gives maximum strength concrete, minimizes concrete surface failures\* or rainfall damage.

\*In hot, dry areas, use of Konkure White is especially recommended.

### GENERAL PURPOSE

**KONKURE Clear** — for curing concrete where retention of natural color is desired — a fugitive orange dye is used in Konkure Clear to insure application visibility — the color disappears within an hour.

**KONKURE White** — architecturally attractive, white pigmented, to minimize surface cracks resulting from exposure to light and heat rays in hot, dry areas.

**KONKURE Black** — an asphalt base waterproofing and curing compound competitively priced — also serves as a bonding agent for asphalt tile application.

**KONKURE Gray** — glare reducing — gray pigmented to minimize surface cracks resulting from exposure to light and heat rays in hot and dry areas.

### TILT-UP and LIFT-SLAB



**KONKURE P. C. C.** — a resin base curing compound and bond breaker combined — may be painted without treatment upon erection.

Write or Phone for Full Information

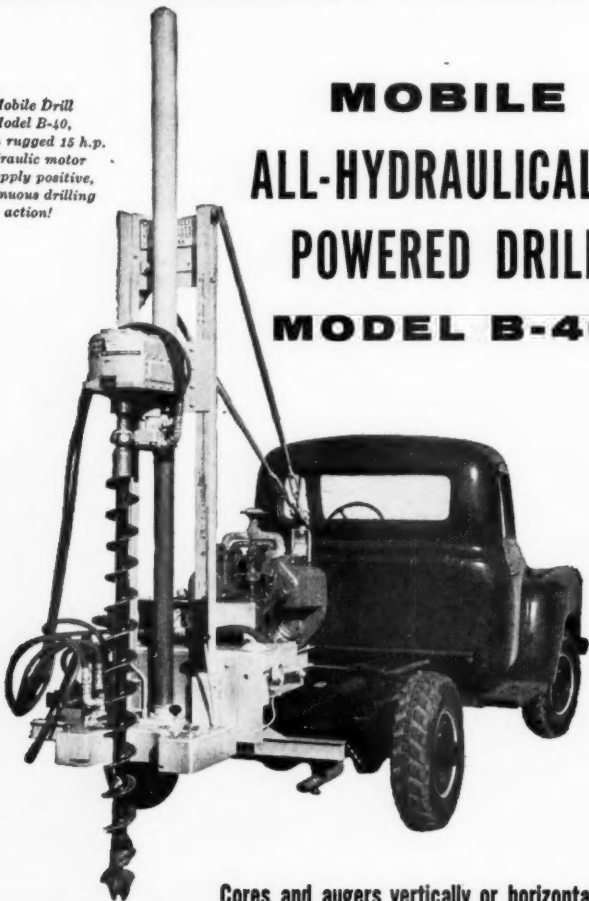
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## New! Versatile! Portable!

Mobile Drill  
Model B-40,  
with a rugged 15 h.p.  
hydraulic motor  
to supply positive,  
continuous drilling  
action!



## MOBILE ALL-HYDRAULICALLY POWERED DRILL MODEL B-40

### A COMPLETE LINE OF MOBILE DRILLS INVESTIGATE!

#### MODEL B-27

● Light! Powerful! Field proven for exploratory work in unconsolidated formations. Mounts on Willys vehicles P.T.O. driven. America's most outstanding light, portable rig.

#### MODEL B-35

● A convertible drill for vertical-horizontal work, featuring a new safety hydraulic clutch. Willys mounted, operated by P.T.O.

#### MODEL B-36

● A tough, portable rig for heavier formations and P.T.O. operated. Mounts on any 4-wheel drive International or Dodge Power Wagon.

#### MODEL B-52

● Heavy-duty! Operated by Ford Industrial Power Plant. Built to withstand terrific torque of toughest formations. Adaptable to a really extensive list of uses.

**Cores and augers vertically or horizontally. Brings economy to under-highway boring.**

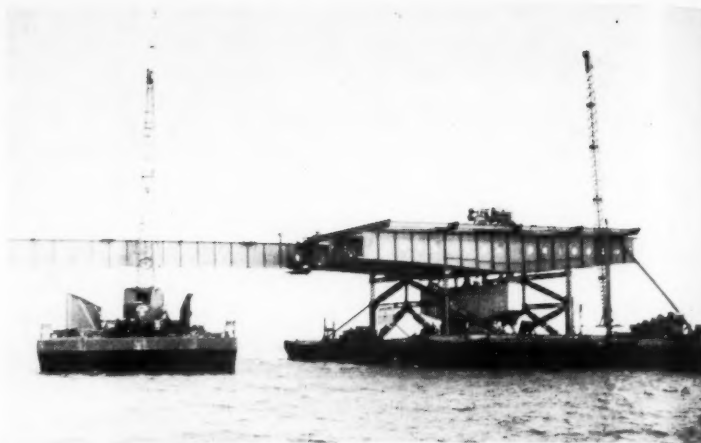
Light, powerful, low-cost drilling . . . yours, with the new Mobile Drill Model B-40. This one-man-operated rig easily mounts or dismounts on the front, rear, or side of all vehicles, including wheel or crawler tractors. Cores with air or water to 200', augers to 75' in minutes. The B-40 quickly converts to any degree in a 360° angle, cuts costs on underground water, gas, and power-line installations. Light enough for air transport to remote areas, powerful enough for a complete range of tough exploratory jobs. Never before has such a LOW COST drill with such amazing power and versatility been offered. Write, phone, or wire today for complete information!



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World's Largest Manufacturer of Light Vehicle Powered Drills

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A closure section is made by the floating Manitowoc crane. The 150-foot haunch girders are carried on falsework on the barge.

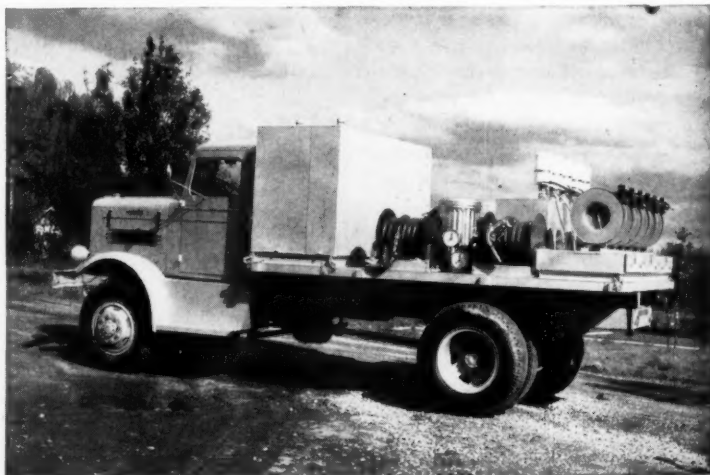
## Traveler varies procedure

**Big rig is turned around on span to save time, facilitate work; tide lowers 150-foot haunch girders into place on approaches**

Unique bridge-erection procedures—involving the maximum use of tides for placing 150-foot-long haunched girder sections on approach piers, and reversing the direction of a traveler on the approach spans—helped com-

plete the superstructure of the 4,500-foot-long Turtle River bridge that carries U. S. 17 across the river at Brunswick, Ga.

American Bridge Co., Pittsburgh, Pa., started placing northern ap-



## Compact lube unit keeps things running smoothly

Using this CEMCO Lubricating Truck to deliver fuel for gasoline and diesel engines, lubricating oils and greases, compressed air, will noticeably affect both down-time and overall maintenance expense.

Through a 30 1/2" hose on each of six different reels all lubricants and fuels are metered and delivered without loss—without muss. Diesel fuel tank holds 400 gallons—gasoline tank—200. Oil and lubricant tanks are 400# capacity—each with fuel pump. High pressure grease has two hose reels to speed servicing.

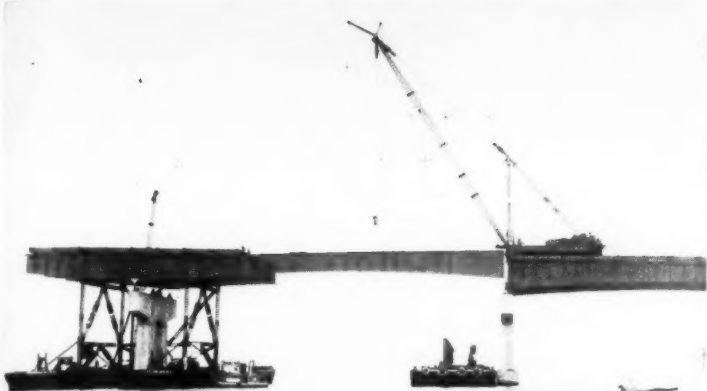
Study your 1956 projects—include this unit in your budget—start the savings now!

Write for complete specification and prices!

**CEMCO INDUSTRIES, INC.,  
GALION, OHIO**

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CONTRACTORS AND ENGINEERS



The traveler sets steel for another span on the 4,500-foot-long bridge. This closure section is made before the tide goes out.

## erecting superstructure

approach-span steel in May, 1955, using a floating Manitowoc crane with 70-foot boom and 30-foot jib. This rig placed three girders per span for the first four spans, which had lengths of 60 and 107 feet. These, like all the

approach spans and the lift span, were constructed with riveted connections. When the first four spans had been finished, the Manitowoc erected a traveler on the spans. Powered by a GM diesel, the 50-ton-capacity trav-

eler with 100-foot boom placed the remainder of the northern approach spans. These included a 60-foot span, four spans at 107 feet, and nine at 150 feet.

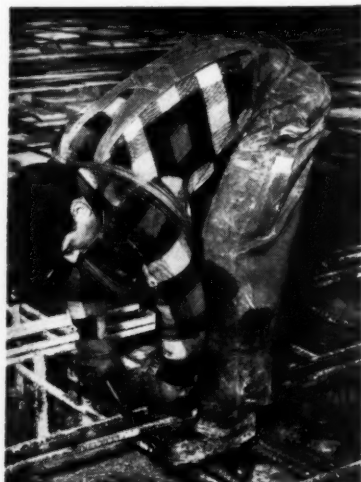
Two barges, tied together with a framework of steel, were used to place the 150-foot haunched sections on each pier as the tide began to run out. A framework of steel, erected on the barges, served as a falsework to support the haunched girders. When girders were towed out to a pier at high tide, the two barges were spaced so that they straddled the pier. Then, as the tide went out, the haunched girders were lowered until they came to rest on the pier.

Once the haunched sections were set, the traveler placed a closure section to complete the 150-foot spans.

This made it possible for the traveler to walk out to the cantilevered portion of the haunched girder and place another closure section to complete the adjacent span. This operation was continued until the north pier of the lift span was reached. The traveler then erected the two vertical sections of the lift span tower, which rises approximately 151 feet above the reinforced-concrete piers. When work on these two lower sections had been finished, the traveler erected a guy derrick with 130-foot boom, which completed the tower by jumping as it went up.

At this phase of the operations, when work was about to begin on the southern approach spans, the first big problem arose: the first few pier spans

(Concluded on next page)



## DANGER

This man doesn't realize he is in danger. But he is. Just look at the old-fashioned shoulder coil of tie wire. It's heavy and clumsy... can easily catch on protruding objects... must be removed to do other work... and, if he picks it up again, the wire ends can scratch his neck or back, or injure his eyes.



## SAFETY

WITH  
**CAL-TIE® WIRE**  
in the handy  
reel dispenser

This man is safe. He's using Cal-Tie Wire in the handy reel dispenser. It's light in weight, and there's no clumsy coil to catch on protruding objects... no wire ends which endanger his eyes... no chance of infections from scratches... no lost time accident. No wonder so many contractors are switching to this modern way of tying re-bars. Why don't you investigate Cal-Tie Wire in the handy reel dispenser today?



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THE COLORADO FUEL AND IRON CORPORATION

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WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia  
CF&I OFFICE IN CANADA: Toronto • CANADIAN REPRESENTATIVES AT: Calgary • Edmonton • Vancouver • Winnipeg

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## The ground gave way

...but our Hartford Contractors' Equipment policy gave us the solid protection we needed!

(Based on Company File #9A003123)

Just as we were inching our crane around the pilings on a river bank, the ground gave way...

Of course the accident *would* happen to a brand-new rig! We'd had it less than six weeks. And there it was—wrecked.

I called my Hartford Agent. He set my mind at rest immediately. He

reminded me of the automatic 45-day protection we had on new equipment under our Hartford policy. And he had an adjuster on the job in a matter of hours.

There wasn't any red tape. Not a bit! We repaired the crane. The Hartford Fire Insurance Company promptly paid us \$3,232.10.

Your investment in equipment ties up a lot of your money. Too much to take chances with.

So play it safe. Get the broad coverage offered by a Hartford Contractors' Equipment Policy. Then you're covered against loss by overturn... collision... fire... theft... explosion and other specific hazards.

No time like *now* to look into this. Call your Hartford Fire Insurance Company Agent or your insurance broker today. You'll be glad you did.

Year in and year out you'll do well with the

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A key reference —

## THE TECHNOLOGY OF CEMENT AND CONCRETE

Volume I — Concrete Materials

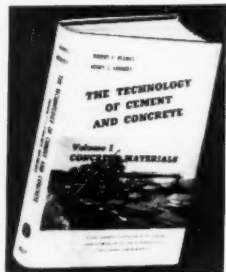
By ROBERT F. BLANKS, *Great Western Aggregates, Inc.*, and HENRY L. KENNEDY, *Dewey & Almy Chemical Co.* Covers all important facts about materials used in concrete. Treatment of cementing materials and admixtures spans full range from portland cement to special-purpose types. Section on concrete aggregates discusses types, geology, effects, and testing. Self-contained, the book can be used for complete survey or ready reference on specific topic. 1955. 422 pages, 155 illus. \$11.00.

For sale by

CONTRACTORS & ENGINEERS

470 Fourth Ave.

New York 16, N. Y.



(Continued from preceding page)

were so low that floating equipment could not get close enough to the piers to place steel. Yet spans had to be placed so that the traveler could erect the spans.

The first step American Bridge took to solve the problem was to bring its floating stiffleg and crane into the water far enough to allow barges to approach the piers. The stiffleg and crane then erected a few spans in the river, taking the girders from the barges. This done, the traveler on the northern approach was dismantled and erected on the completed spans on the southern approach.

With the traveler located between the shore and the proposed lift span, it could start work in either of two

ways. Under the procedure used, the traveler began walking toward shore first, erecting steel for the approach. When it reached the shore, it reversed its direction and walked toward the lift span to complete the approach. Then it was dismantled.

If this sequence had not been adopted, the traveler would have had to be turned around twice—a long tedious job that required about three days. The rig would have walked toward the lift span, turned around, walked toward shore, turned around again, then walked back out to a point where floating rigs could begin the dismantling job.

The method used to construct the southern approach spans had a number of advantages. First of all, it saved time, since American Bridge did not have to wait until work at the shore end of the bridge was completed before moving the traveler onto the southern approach spans. Second, this method made it possible for the traveler to erect a few sections of the lift-span tower, then erect a guy derrick to complete the tower, as soon as approach-span work had been finished. Last, the technique enabled the decking contractor to put down the reinforced-concrete deck, which has a 56-foot curb-to-curb roadway, from the south shore to the opposite end of the bridge.

### Turning the traveler

Though the procedure itself is simple, the job of turning the traveler after it had placed all the approach spans at the shore end of the southern approach was not.

When the traveler was ready to be turned around, it was jacked up and steel grillage beams placed beneath it. These beams were supported by the completed spans. Gulf lubricating grease was then applied to the top of the grillage beams and the traveler lowered onto them. Turning the traveler 180 degrees took about three days. Then, when the traveler was ready to walk back towards the lift span, it was again jacked up, the grillage beams were removed, and the rig set back down on the completed bridge girders to finish setting steel for the remaining southern approach spans.

### Lift span fabricated

The 264-foot lift-span section was completely fabricated in Brunswick on a floating barge and was supported by a steel falsework. Approximately 534 tons of structural steel sections for this span, delivered by rail to a siding adjacent to the floating span, was placed by the Manitowoc crane. Approximately 140-tons of I-Beam-Lok flooring was incorporated in the span before it was towed the few miles to the bridge site and set between the towers as the tide went out.

J. R. Perny was the superintendent and Chuck Ivey, the field engineer, for American Bridge Co. Seaboard Construction Co., Brunswick, Georgia, placed the reinforced-concrete deck on the approach spans, and H. M. Pafford Jr., Waycross, Ga., built the elaborate fender system for the structure, which is the largest of its kind in Georgia.

THE END

CONTRACTORS AND ENGINEERS

# FAWICK AIRFLEX POWER TAKE-OFF

types "O" and "OO"  
for heavy-duty  
power transmission  
100—750 H. P.

**POSITIVE POWER TRANSMISSION**—Full power and torque control at all times is assured by use of Fawick CB Airflex Clutches. Built for severe service, these clutches furnish smooth, shockless action with maximum efficiency.

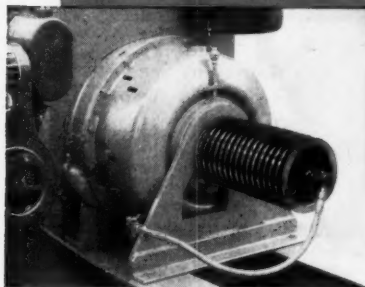
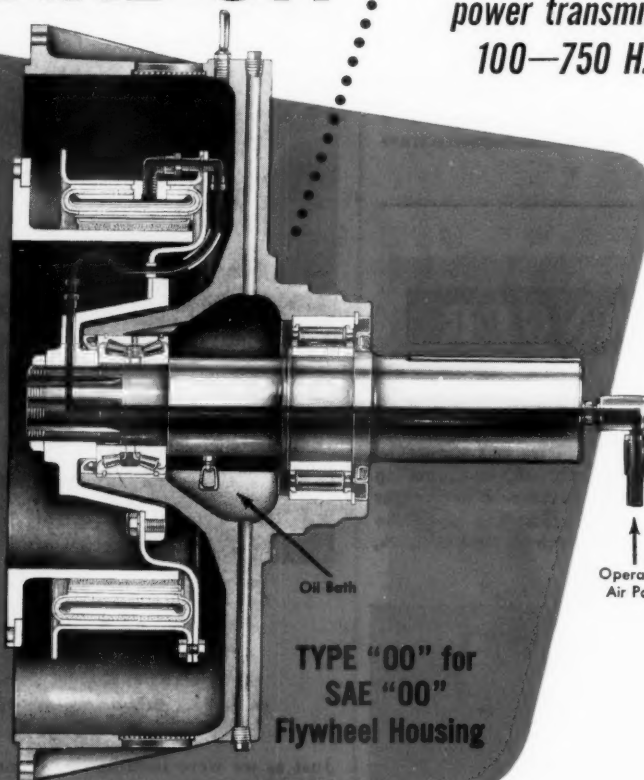
**RUGGED SHAFT BEARINGS**—Anti-friction roller bearings are lubricated in a continuous oil bath.

**QUICK INSTALLATION**—SAE Standard Mounting flange for speedy assembly to all types of power plants, either as original equipment or for field replacement of existing power take-offs.

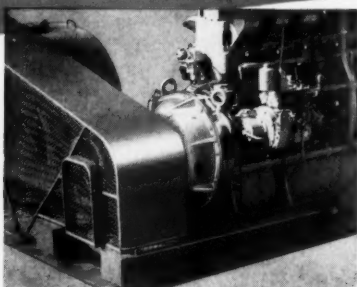
**EASE OF CONTROL**—Air-actuated for convenient control, either local or remote.

**HIGH STRENGTH DESIGN**—Fawick compact design and rugged construction assure strength to withstand heavy side pull on belt or chain-driven applications. Pilot and outboard bearings are not required.

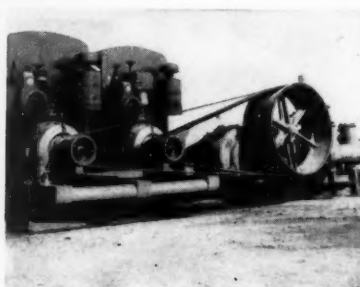
**NO ADJUSTMENTS**—Self-adjusting pneumatic clutch eliminates down-time and maintenance cost required to adjust for normal friction shoe wear.



Compact design and rugged construction eliminate need for outboard bearing on this Fawick Airflex 0-14CB400 Power Take-Off driving a multiple-groove sheave.



This rugged Fawick Airflex 00-22CB500 Power Take-Off drives a mud pump through a sheave and "V" belts. Air-actuated to provide remote control from oil driller's position.



Two gas engines, each equipped with a Fawick Airflex 0-14CB400 Power Take-Off, simultaneously drive the same pump sheave through "V" belts. Engines may be operated individually . . . no compound is needed.

For more information on Fawick Airflex Power Take-Offs, consult your nearest Fawick Representative or the Home Office in Cleveland. Ask for Bulletin ML-149.

## FAWICK AIRFLEX DIVISION

FAWICK CORPORATION

9919 CLINTON ROAD • CLEVELAND 11, OHIO

IN CANADA: FAWICK CANADA, LTD., TORONTO — MONTREAL

For more facts, use Reader-Reply Card opposite page 18 and circle No. 335

# FAWICK Airflex

INDUSTRIAL CLUTCHES AND BRAKES



The Easton rail tractor is recommended for hauling muck cars in tunneling operations.

### Rail tractor powered by storage battery

■ A self-propelled, materials-hauling unit that runs on rails is available from the Easton Car & Construction Co. The Easton rail tractor is powered by a storage battery and is recommended for towing muck cars in tunneling operations.

The tractor is built to pull two trailer cars with a gross trailer load of 5 tons. The trailer cars are also manufactured by Easton.

The storage battery provides sufficient power to assure starting with a full load from a standstill on a curve, according to the manufacturer. The tractor and its trailers operate on 24-inch-gage track at speeds up to 300 fpm. They are reportedly able to negotiate sharp-radius curves at 50 fpm.

For further information write to the Easton Car & Construction Co., Easton, Pa., or use the Request Card that is bound in at page 18. Circle No. 157.

### Tractor-drawn rake

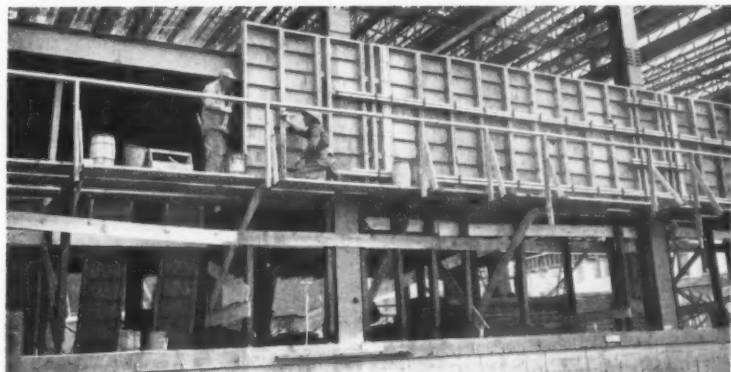
■ Four models of York rakes for landclearing contractors are described in literature from York Modern Corp. Job photos show the tractor-drawn units raking stones, roots, and debris; spreading topsoil; and grading, leveling, and mulching. More action shots point out that the rakes can be reversed for bulldozing. The specification table lists the maximum working width of the Model RE as 8 feet, and 6 feet for Models RFC, RFA, and RFB.

To obtain the literature write to York Modern Corp., Unadilla, N. Y., or use the Request Card at page 18. Circle No. 70.

### Swivel-type tire valve

■ A swivel-type large-bore tire valve designed by A. Schrader's Son, Division of Scovill Mfg. Co., Inc., for off-the-road equipment is described in a bulletin. A picture of the entire unit illustrates the fact that the swivel permits right or left-hand mounting. A diagrammatic picture points out the construction features of the bore. Extensions and accessories are pictured, diagrammed, and described.

To obtain Form A231A write to A. Schrader's Son Division, Scovill Mfg. Co., Inc., 470 Vanderbilt Ave., Brooklyn 38, N. Y., or use the Request Card that is bound in at page 18. Circle No. 62.



9,000 sq. ft. of Symons Forms ressed 12 times on this job. William Baumeister Const. Co., St. Paul, Gen. Cont.

### Spandrel Beam Forming Cost Cut 2/3 with Symons Forms

Because of the efficient combination of Symons forming, shoring and scaffolding methods, the contractor was able to cut his estimated cost by two-thirds on the \$2,000,000 home office building of the Minnesota Mutual Life Insurance Company of St. Paul, Minnesota.

In addition to savings in labor cost, considerable time was saved in forming the Spandrel Beams of this 9-story building. The adaptability of Symons Shores with their safe "T" heads speeded the forming and scaffolding work. 2 x 8 ft. Symons Steel Rib forms were used to frame 56,000 square feet of Spandrel Beams. Symons Shores were used throughout in beam construction. All foundation walls are 16 feet in height.

Send for our Catalog F-10 which gives complete information on Symons Forming. Symons Clamp & Mfg. Co., 4251 Diversey Avenue, Dept. J-6, Chicago 39, Illinois.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 336



**Now from INTERNATIONAL...**

## New "all-purpose" light-duty 4-wheel-drive truck!

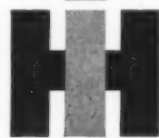
Here's the four-wheel-drive truck you've been waiting for! Here's a full-size, all-purpose truck you can use to go anywhere.

On or off the road, this new INTERNATIONAL S-120 (4x4) will take the toughest grades in stride—fully loaded, it will move entire 7,000 lbs. of truck, body and cargo through soft sand, mud or snow. It's made to match all light-duty 4x4 jobs *exactly* with choice of 2 engines, 3 pickup, 2 stake and platform bodies, and the 8-passenger, triple-duty Travelall.® Exclusive INTERNATIONAL full-torque power take-off transfer case available, plus power take-off transmissions for auxiliary equipment operation. Available in 6 tire sizes, including 7.00 x 18 for extra clearance and 9.00 x 16 for extra flotation and traction.

This new INTERNATIONAL is all truck-built for rough, tough four-wheel-drive service . . . built to save you the BIG money, the operation and maintenance money. Before you buy any light-duty four-wheel-drive truck, see and drive this one at your INTERNATIONAL Dealer or Branch!

INTERNATIONAL HARVESTER COMPANY • CHICAGO

# INTERNATIONAL TRUCKS



**All-Truck Built to save you the BIG money!**

Motor Trucks • Crawler Tractors • Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors  
For more facts, use Reader-Reply Card opposite page 18 and circle No. 337

### A Complete Line of All-Wheel-Drive Trucks for Every Tough Job Need



S-140 (4x4), 11,000 lbs. GVW. Has 4-speed transmission and 2-speed transfer case, for 8 forward and 2 reverse speeds.



Bigger models, too. S-160 (4x4) Series, 15,000-18,000 lbs. GVW. SF-170 (6x6) Series, to 26,000 lbs. GVW. All have exclusive INTERNATIONAL full-size Comfo-Vision cabs . . . feature easiest steering and handling.



A tunnel worker tightens a Republic Steel forged wedge-head rock bolt.

## New tunnel bolt eliminates need for shoring

■ Capable of sustaining a 40,000-pound pull-out in hard rock, a  $\frac{3}{4}$ -inch steel rock bolt with a forged anchoring head and expansion shield is now being made available for tunnel work and general construction purposes by Republic Steel's Bolt & Chain Division.

According to the manufacturer, extensive tests have shown the new bolt to register 10,000 pounds more pull-out than slotted-type bolts and square-head-type bolts with expansion shells. The bolt provides support by tying rock together. It is intended to provide maximum shoring safety in

stratified and unstratified rock for ribs, walls, and roofs in all types of tunnels, aqueducts, building foundations, dams, and other permanent construction. Used in proper numbers and patterns, the bolts will all but do away with the need for timber shoring, the company claims.

The anchoring end of the bolt has a wedge head and shield; the exposed end is roll-threaded. It can be obtained in stock lengths from 2 to 8 feet, or can be made on order to any specified length.

A ready-made place of attachment for forms used in guniting or concret-

ing in certain types of tunnels is provided by the projection of the threaded end of the bolt from the anchoring hole. This projection may also be used for attaching cables and other rigging.

The wedge-head rock bolt may be used to tie two or more strata together to form a laminated beam strong enough to support itself as well as overlaying rock. It may also be used to suspend weak strata from a stronger strata a few feet deeper. Still further, the bolt can be used as a clamp to squeeze cracked and jointed strata together in a circular zone so that the fragments tend to cohere in a solid mass. A number of rock bolts around the perimeter of a tunnel will reinforce the tunnel walls and roof so that a strong arched support will be provided.

The forged wedge-head-type bolt is available in either high or low-carbon steel, and is suitable for installation in stoper-driven or auger-drilled holes.

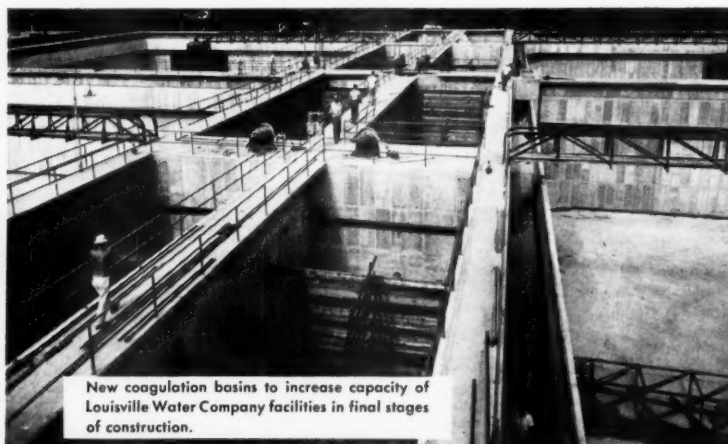
For further information write to the Bolt & Chain Division, Republic Steel Corp., Truscon Ave., Cleveland, Ohio, or use the Request Card at page 18. Circle No. 129.

## Financing plan

■ A financing plan for purchasers of heavy equipment and machinery is briefly outlined in a pamphlet from Associates Investment Co. Cartoon-type illustrations point out the fact that the service is on a local basis with a minimum of detail. The pamphlet further states that protection of customer good will, fast and dependable service, and a competitive rate are provided.

To obtain the pamphlet write to Associates Investment Co., Associates Bldg., South Bend, Ind., or use the Request Card at page 18. Circle No. 29.

## How Pre-Fab Forms Saved Time, Material On Water Plant Job



### Contractor Forms 200,000 sq. ft. contact area with 14,000 sq. ft. of panels

Forming a 350' square water basin with exterior and interior walls 31' high presents no problem to the experienced contractor. But, when the job must be done in minimum time at lowest possible cost to meet tough pouring and finishing specifications, careful planning and operation are required.

When the Henry G. Bickel Company and the Charles A. Connel Company were awarded the contract for the massive Louisville Water Company coagulation basins at Louisville, Kentucky, they selected the Uni-Form Panel System to form the 200,000 sq. ft. of contact area the job required.

Forming started fast, because the Uni-Form Panel System is ready to use when it reaches the job. Valuable time, labor and material savings were made because Uni-Form Panels require minimum alignment and bracing on 1 side only. The Uni-Forms were assembled and locked into a tight, rigid form with Uni-Form Ties supplied in exact lengths to provide automatically accurate thickness of both battered and straight walls.

One side of the form was erected, permitting easy, unhampered placement of reinforcing. Since specifications

did not permit the use of chutes or tremies, pouring pockets were provided as the forms were closed to maintain positive control of concrete placement.

Fast erection and stripping features of the Uni-Form System enabled the contractor to form the entire 200,000 sq. ft. of contact area with only 14,000 sq. ft. of Uni-Form Panels. Panels were used an average of 14 times without the necessity of maintenance or repair.

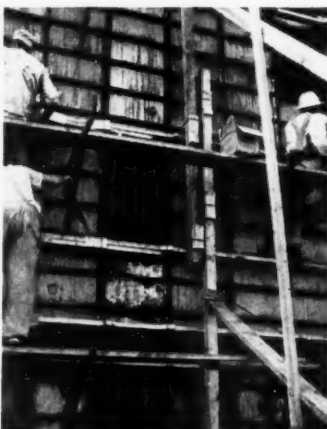
The simplicity of the Uni-Form Panel System, together with the services provided by Universal Form Clamp Co., insured fast job progress and satisfactory completion under the capable supervision of Harry Hunter, Supt.

Uni-Form Panels are versatile, high speed forming tools. They're used by the country's most successful contractors to form every conceivable type of construction. They are rented or sold. Universal Distributors and Branches are located from coast to coast. Write for Uni-Form Catalog and complete details on Uni-Forming—the modern way to form concrete.

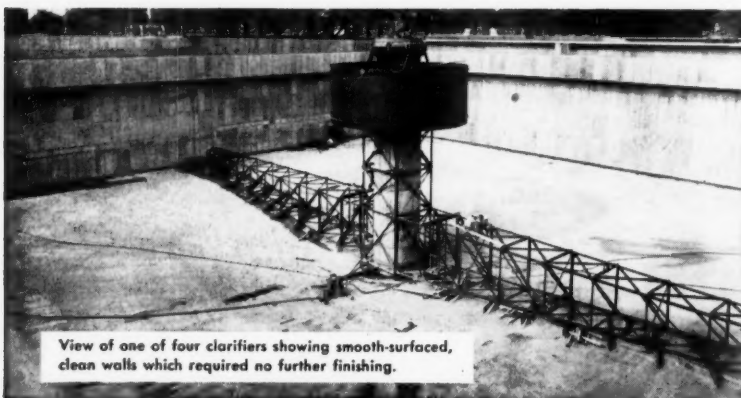
**UNIVERSAL FORM CLAMP CO.**  
1238 N. Kostner Avenue • Chicago 51, Ill.



Section of exterior battered wall 31' high, showing Uni-Forming nearly complete. Uni-Form Scaffold Brackets replaced costly conventional scaffolding systems.



Pouring pockets permitted specified control of concrete placement.



View of one of four clarifiers showing smooth-surfaced, clean walls which required no further finishing.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 338

# DUDGEON HYDRAULIC JACKS

**SALES  
RENTALS**

**CAPACITY  
TO  
400 TONS**

FOR:  
PILE  
TESTING  
UNDER-  
PINNING  
BRIDGES  
PIPE  
PUSHING

Write to  
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**SOIL TESTING**

**DESIGNERS and  
MANUFACTURERS OF**

## Hydraulic Units For Special Applications

**RICHARD  
DUDGEON INC.** EST. 1850

789 BERGEN STREET BROOKLYN, N. Y.  
• ST 9-4040 •

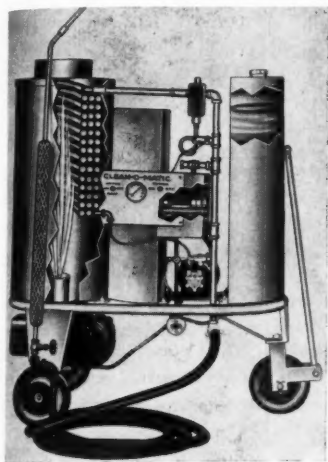
For more facts, circle No. 339

CONTRACTORS AND ENGINEERS

## Steam in 2 minutes from automatic steam cleaner

A fully automatic steam cleaner has been added to the Siebring steam cleaner line. The Clean-O-Matic is electrically controlled, oil or gas-fired, and will provide steam in less than two minutes, according to the company.

Operation of the unit involves two switches, one for the water pump and



one for the burner. The soap-solution tank is self-contained to mix detergents and chemicals with steam within the machine. The ready-mixed solution is carried through a single hose direct to the steam lance. The operator has complete control of the entire unit through a shut-off valve at the handle.

Two nozzles are included as standard equipment. One nozzle is flat to handle floors, walls and all other flat-surface cleaning, while the other is round for maximum-impact cleaning on hard-to-clean objects and those requiring greater concentration force.

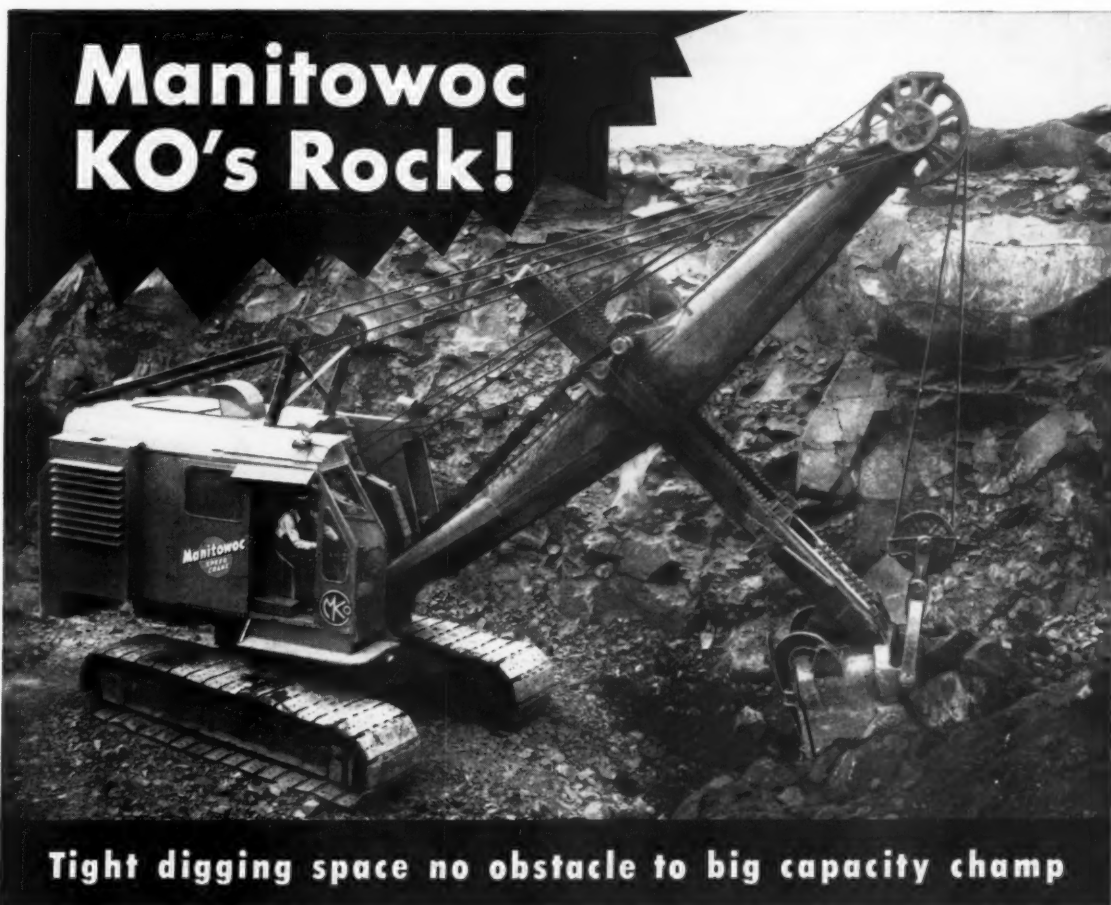
For further information write to the Siebring Mfg. Co., 701 Main St., George, Iowa, or use the Request Card at page 18. Circle No. 22.

AGGREGATE IS HAULED TO THE BATCH PLANT on this road-construction site by a fleet of 25-yard dump semi-trailers pulled by International Model RF-192 6-wheel tractors. This Indiana toll-road project is being constructed by the Arcole Midwest Corp., Skokie, Ill. The firm operates an all-



International truck and trailer fleet on this 6.6-mile project near South Bend. Approximately 2,000 feet of 24-foot-wide concrete pavement is being completed each day. In addition, 19 bridges have been erected. For more details on International vehicles circle No. 5 on the Request Card at page 18, or write to International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

## Manitowoc KO's Rock!



**Tight digging space no obstacle to big capacity champ**

Tough volcanic rock has met its master in the rugged 2½-yd. Manitowoc shovel used by Morrison-Knudsen, Inc. during one construction stage of Dalles Dam. The job involves relocating 14 miles of road bed for the Seattle-Portland-Spokane Railroad. Well over a million yards of volcanic rock have to be excavated before the project is finished, and this unit will be on the job till the end. Working in extremely narrow quarters, the Manitowoc 3500 is moving over 2,000 yards daily of the unusually hard-to-handle heavy rock. Torque converter power assures smooth, steady digging; positive steering is a must in the tight working space; an all-cast, manganese Esco dipper (optional) is specially rugged for tough rock work. Here's a rough job calling for a machine having the guts and power of a real rock shovel, with the mobility of a small excavator.

**Extremely clean, simple design** of the Manitowoc shovel produces more bite at the dipper because no power is wasted. Only 17 gears and pinions are in the entire machine, with only working gears turning to get full capacity from every unit of horsepower. Exclusive sliding pinion arrangement uses one set of clutches to drive travel, swing and boom hoist.

**Shovel boom is high-strength alloy steel** . . . built to take severe twisting and bending under tough digging conditions. Twin dipper sticks are of reinforced box section design . . . roll through saddle blocks on four adjustable rollers, achieving full utilization of power.

**Simple, fool-proof air controls** help eliminate operator fatigue. Smooth torque converter power makes for a more efficient operating cycle. There's no stalling of the motor, no over-loading . . . power is perfectly balanced to the load. You get the most efficient use of your machine with torque converter power . . . pioneered by Manitowoc in excavators.

Take advantage of Manitowoc's superior features. Your helpful Manitowoc distributor can fill you in on the complete story. Call or write him today for literature and specifications!

Manitowoc Engineering Corp., Manitowoc, Wis.

# MANITOWOC

SHOVELS  
1-5½ YD.

CRANES  
20-100 TON



For more facts, use Reader-Reply Card opposite page 18 and circle No. 341

IF IT'S A



PLAY SAFE! ASK FOR A  
DEWATERING ANALYSIS BY

## GRIFFIN

WELLPOINT CORP.

881 East 141st Street, New York 54, N. Y.  
Hammond, Ind. Houston, Tex. Jacksonville, Fla.

In Canada: Construction Equipment Co., Ltd.  
Toronto Montreal Halifax

For more facts, circle No. 340

SEPTEMBER, 1956

125

In the 300-acre borrow area, a Caterpillar DW15 scraper, push-loaded by a Cat D8 tractor, picks up a 10-cubic-yard payload of sand that will be used for pervious fill in the random trench under the dike. ► C&E Staff Photos

## BROWNHOIST bridge and crane BUCKETS

we have the type and size to best handle the job, dependent on material and equipment

Open-type grab buckets and link-type buckets for bridge cranes, fast-plant unloaders and large gantry cranes are available in capacities from 35 to 400 cubic feet.



Because of their simplicity of design and rugged construction, Brownhoist buckets (such as the link-type left or the open type grab bucket above) withstand extremely severe abuse. Abrasion-resistant alloy steel nose plates protect against coarse materials.



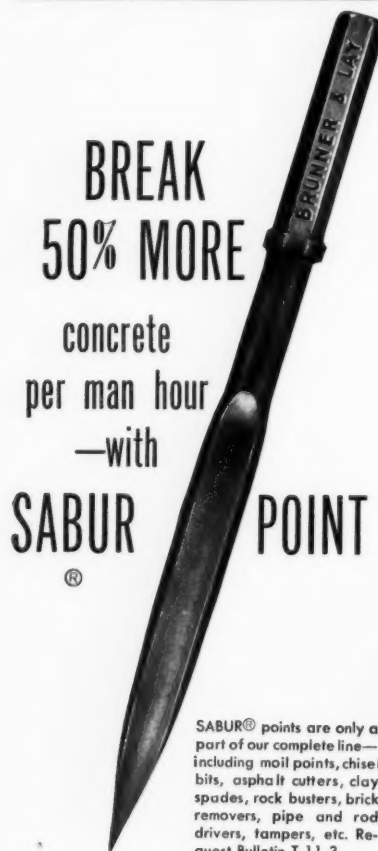
Brownhoist clamshell buckets (right) in capacities from 1/2 cu. yd. to 3 cu. yds. are used with cranes for handling coal, ore, sludge, slag, rock or wet clay. They're engineered (as a result of over 80 years experience) to take full bites, year after year with trouble-free operation. Write today for catalog.



### INDUSTRIAL BROWNHOIST CORPORATION BAY CITY, MICHIGAN

185-A

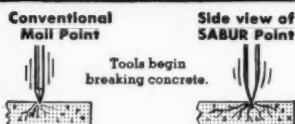
For more facts, use Reader-Reply Card opposite page 18 and circle No. 342



**BREAK  
50% MORE  
concrete  
per man hour  
—with  
SABUR POINT**

SABUR® points are only a part of our complete line—including moil points, chisel bits, asphalt cutters, clay spades, rock busters, brick removers, pipe and rod drivers, tampers, etc. Request Bulletin T-11-3.

#### COMPARATIVE PERFORMANCES OF SABUR POINT AND CONVENTIONAL POINT



Two inches into concrete. The conventional moil point ends its breaking action. SABUR Point's unique wedge-action continues to shatter concrete.



Six inches in. Conventional moil point is simply cutting a hole. The SABUR Point continues its breaking. Wedge-action permits tool to continue its penetration with point riding free. Stays sharper 3 to 5 times longer than conventional tool.



SABUR® Point takes the increased speed of the new-type breakers. Will not stick—easier to use. Make your own comparative test today. If your distributor cannot supply you, get in touch with our nearest office.

### Brunner & Lay Products

Brunner & Lay, Inc. 9300 King St. Franklin Park, Ill.  
Brunner & Lay Rock Bit of Philadelphia, Inc. 2514 East Cumberland St. Philadelphia 25, Pa.  
Brunner & Lay, Inc. 150 Leslie St., Dallas, Texas  
Brunner & Lay Rock Bit of Asheville, Inc. Sweeten Creek Rd., Asheville, N.C.  
Brunner & Lay of Los Angeles, Inc. 2425 East 37th St. Los Angeles 58, Calif.  
Brunner & Lay of Portland, Inc. 660 N. Tillamook St., Portland 12, Ore.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 343



## Earth quantities moved fast for lock and dam project

Within the next three months, the last of 2 1/4 million cubic yards of sand and clay will be placed for the 6,130-foot-long non-overflow earth dike for the newest project on the Chattahoochee River in Georgia. This facility for the \$86 million lock, dam, and powerhouse near Fort Gaines is located on the Alabama side of the Chattahoochee and will connect the powerhouse of the dam to the high, level ground forming the western end of the dike.

Part of a plan for the development of water resources of the Apalachicola, Chattahoochee, and Flint Rivers, the Fort Gaines project will consist of a powerhouse, a concrete-gated spillway, and a lock in and adjacent to the original river channel, with earth dikes connecting these structures to high ground on both banks. Concrete non-overflow structures will also be located on both sides of the lock and between the powerhouse and earth

dike on the Alabama side. The dam, requiring about seven years to build, will have an over-all length of 2 1/2 miles.

In tackling this earthmoving job, Moss Construction Co., Columbus, Ga., first excavated the clay topsoil from the 100-foot-wide random trench that runs under the dike, its downstream edge under the downstream toe of the dike. The trench, which handles rain water seeping through the downstream side of the dike was excavated to an average depth of 10 feet by six Caterpillar DW15 and three Caterpillar DW10 scrapers. This material was hauled to the upstream side of the dike where an impervious fill material was required.

Though the design specified that backfilling be done with any random pervious fill, the select sand abundant in the nearby borrow area was used. The 10 feet of backfill was topped

### FINEST PRECISION SWIVELS IN THE WORLD

**SCRAP MAGNET HOOK UP**

**80 TON PLACEMENT**

**90 TON TRANSFORMER**

**HYDRAULIC TOWERS**

**MILLER WEDGE SOCKET**

There are many practical, diversified uses for Miller Swivels, in capacities from 700 lbs. to 250 ton. 16 different styles in stock... special adaptations designed on request.

**Miller BALL BEARING SWIVELS Products**

**GENERAL MACHINE & WELDING WORKS inc.**  
1100 East Second St., Pomona, Calif.  
P. O. Box 938 Dept. C-2

For more facts, use Reader-Reply Card opposite page 18 and circle No. 344

with a 4 select su making sand con trench. A fill was p Tampo 4 by a Cat

The d requiring high, is sand bor erpillar slope of side; th pervious the dike The up sists of top port elevation level, wi layer of blanket. be a 10- point th on a 3 t An in wide an

MA PNEUM GROU an "P SHOO Sim to Oper Hig Effic The Ma places l mines, s grades. sodium ing cavi This ver readily b er" for gravel b packing Write de



**Non-overflow embankment requires 2¼ million yards of sand, clay; scrapers pick up 15-yard capacities as they work in clay borrow pit**

with a 4-foot select pervious fill, the select sand used for this purpose making the average depth of pervious sand come to 14 feet in the random trench. As each 1-foot layer of back-fill was placed, it was compacted by a Tampo 40-ton pneumatic roller pulled by a Caterpillar DW15 tractor.

#### Dike construction

The downstream side of the dike, requiring a random fill about 65 feet high, is being built up with the select sand borrow and compacted by a Caterpillar D8 tractor. This fill has a slope of 2.5 to 1 on the downstream side; the slope adjacent to the impervious fill of the upstream side of the dike has a slope of 0.8 to 1.

The upstream side of the dike consists of an impervious clay fill. The top portion of the 2.5 to 1 slope, from elevation 215 to 180 feet mean sea level, will be faced with a 24-inch layer of riprap on a 9-inch filter blanket. At elevation 180 there will be a 10-foot-wide berm, and from this point the upstream slope will descend on a 3 to 1 slope.

An impervious blanket, 500 feet wide and having a minimum thick-

(Continued on next page)



On the downstream side of the dike, a Tampo 40-ton pneumatic roller pulled by a Cat DW15 tractor makes about four passes to develop required compaction in the random fill.

## CONTROLLED TRACTION

**Product of ALL-WHEEL DRIVE and ALL-WHEEL STEER**

**Swings That Rear End**



Swings it far to the left, or far to the right, while the grader moves straight ahead. This is a movement that means a lot on many jobs—for cleaning a wet ditch, for instance. Whenever a ditch is too soft to provide traction, the rear end can be swung up on the shoulder where there is good footing.



Swinging the rear end also improves side stability, by increasing the tread from the usual 8 feet to 13 feet. As a result, the blade runs much more smoothly—desirable on all forms of "fine grading"—like this one, of constructing a soil-cement runway.

**Moves More Material**



When an ordinary grader has little material to push, it moves ahead in a straight line. BUT, when a heavy windrow is tackled, side thrust causes the dead front end to become unmanageable and slip sideways. On Austin-Western Power Graders, All-Wheel Drive and All-Wheel Steer team up with the blade...



... so that the rear drivers push behind the toe of the blade—the front drivers pull ahead of the heel of the blade... and the grader moves straight ahead—under perfect control—handling a tremendous windrow with no side slip.

## Only Austin-Western Has It!

... and only Austin-Western Power Graders give you the extreme MOBILITY and earth moving ability of All-Wheel Drive... the extraordinary MANEUVERABILITY of All-Wheel Steer... the unusual versatility of blade MANIPULATION, and the easy MANAGEMENT of all blade

and wheel movements by full hydraulic control. Four BIG M features that team up in every model to do more work, on more different jobs, and in more different places. Austin-Western Works, Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Aurora, Illinois.

### MAYO PNEUMATIC GROUTER and "PEA SHOOTER"

Simple  
to  
Operate  
Highly  
Efficient



The Mayo Grouter quickly and easily places low-pressure grout in tunnels, mines, shafts, foundations, and subgrades. It also may be used to inject sodium silicate emulsions for stabilizing caving or running ground.

This versatile piece of equipment can readily be converted to a "Pea Shooter" for shooting Pea or "Bird's Eye" gravel back of liner plates and back-packing outside lagging plates.

Write for Free Catalog 13 for full details and specifications.



Power Graders • Motor Sweepers • Road Rollers • Hydraulic Cranes



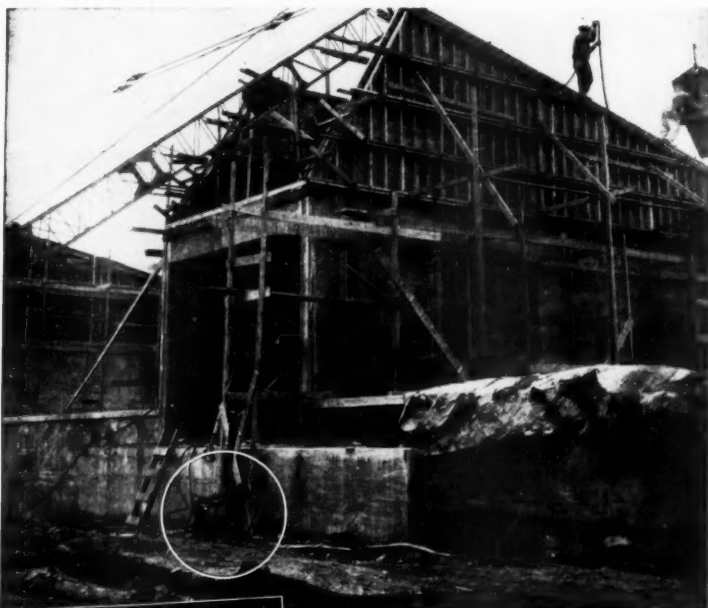
**AUSTIN-WESTERN WORKS**  
BALDWIN-LIMA-HAMILTON  
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OTHER DIVISIONS: Edystone • Lima •  
Electronics & Instrumentation • Hamilton •  
Loewy-Hydropress • Standard Steel Works  
• Madsen • Pelton

For more facts, circle No. 345

For more facts, use Reader-Reply Card opposite page 18 and circle No. 346



A newly developed Allis-Chalmers Model 360 18-yard scraper picks up a load of fill for the 6,130-foot-long dike connecting the powerhouse and the high level ground to the west. A Cat D8 serves as a pusher. C&E Staff Photo



ALL-PURPOSE

## MAGINNISS CONCRETE VIBRATORS

Cut costs on every job!

Whether you're using plastic or stiff mixes, Maginniss Hi-lectric Vibrators will place concrete faster and produce blemish-free finished surfaces.

Powered by a constant-speed 180 cycle 120 volt induction type motor located in the vibrator head for maximum efficiency, Hi-lectrics produce variable frequencies up to 10,500 V P M and maintain constant speed at all times—they do not slow down and lose vibrating effectiveness even under full load in stiffest low-slump concrete! This means you can use all purpose Hi-lectric Vibrators on any job, no matter what the concrete specifications may be.

Because pours are completed faster, labor expense for the entire crew is reduced. One-man operation cuts vibrating costs, too. The Hi-lectric power unit can be located as much as 200 ft. away from the work site—the vibrator operator is free to move about on the forms unhampered by cumbersome, unwieldy flexible shafts. What's more, with blemish-free surfaces, costly hand finishing is eliminated.

Ask your Maginniss distributor to demonstrate on your present job—he'll show you how Hi-lectric equipment can cut your concrete placing costs. You'll find him listed in the Classified Section of your telephone directory.

AA-1828

Simple, rugged construction of Hi-lectric motor-in-head vibrators keeps maintenance costs at a minimum. There are no brushes, commutators or armature windings to burn out.



**MAGINNISS**  
POWER TOOL COMPANY

154 DISTL AVENUE • MANSFIELD, OHIO

For more facts, use Reader-Reply Card opposite page 18 and circle No. 347

(Continued from preceding page)

ness of 5 feet, will be laid along the upstream toe to reduce any seepage through the dike. Topsoil along this upstream toe, which had to be stripped until a natural impervious material was reached, was removed by the fleet of Caterpillar scrapers that also handled stripping operations for the 365-foot-wide base of the dike. The impervious stratum on which the impervious blanket will be placed consists of clay, and where its thickness is less than 5 feet, it will be built up to a minimum thickness of 5 feet before the blanket is put down.

### Borrow area

The 300-acre borrow area for this job is located 1,250 feet upstream from the center line of the dike, the minimum distance required by U. S. Army Corps of Engineers specifications so that natural ground adjacent to the dike will not be disturbed. The 2 to 7-foot stratum of clay covering this area is being used as impervious fill on the upstream portion of the dike. This fill is being hauled by the fleet of scrapers, which load with a pushing assist from two Caterpillar D8 tractors.

Because the scrapers can pick up a larger payload in this clay borrow than they can in sand, production

figures for the handling of the material are running high. A scraper with a 15-yard capacity is picking up 15-yard payloads of clay, but the same unit gets a payload of only 9 to 10 cubic yards when it works in sand.

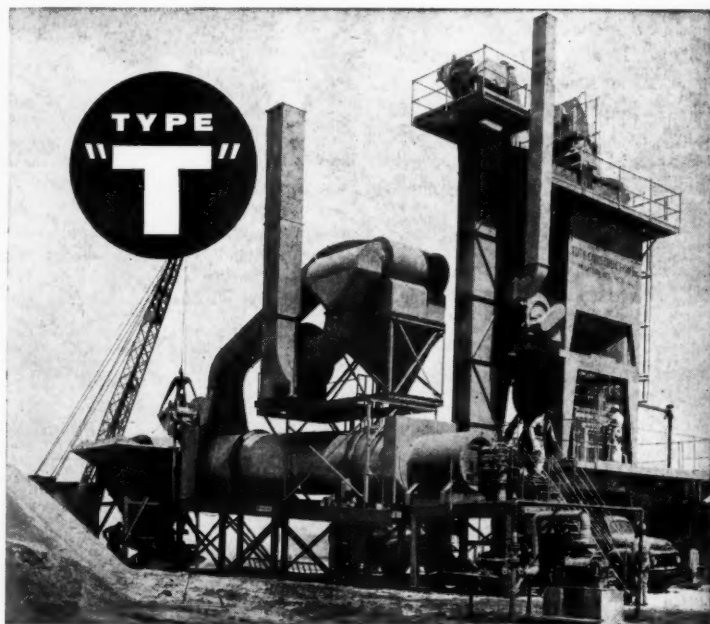
As the fill is being built up, a Tampo sheepsfoot roller, pulled by a Case 500 diesel rubber-tire tractor, is compacting the material.

Under the clay is a 17 to 29-foot sand stratum which provides perfect material for the select pervious fill. So much of this material is available that it was used for the random fill on the downstream side of the dike. Below the sand borrow is another stratum of clay that is unsuitable as fill. Working in the borrow area is the newly developed Allis-Chalmers Model 360 18-yard scraper, which is push-loaded by a Caterpillar D8 tractor with torque converter.

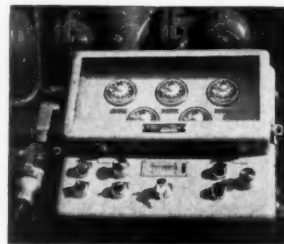
All this equipment, working a 16-hour two-shift day, is moving about 10,000 cubic yards of material when working in sand, and 14,000 cubic yards when working in clay. Moss is also using D8's to pull two Caterpillar scrapers—a 70 and an 80—on short hauls up to 600 feet.

### General features

The drainage ditch located about 20 feet downstream from the toe has an 8-foot-wide base with 1 to 2.5 side



## Now Available With Automatic Cycle Control



Automatic Cycle Control—now on all H & B Type "T" and Mobile asphalt plants.

H & B Type "T" batch type asphalt plants, also the new Mobile completely portable batch plants, are all now equipped with automatic cycle control. This equipment provides for automatic control of the entire mixing cycle, with no loss of time between runs. The operation, however, is still fully under control of the operator, and may be interrupted at any time or operated manually in the conventional manner.

Automatic weighing is also available—as optional equipment—on both Type "T" and Mobile plants—in connection with the Fluidometer system and Automatic Cycle Control to make the entire mixer floor operation automatic.

Complete information about Automatic Cycle Control and completely automatic mixing and batching will be sent on request.

**HETHERINGTON & BERNER INC. • Engineers . . . Manufacturers**  
731 KENTUCKY AVENUE  
INDIANAPOLIS 7, INDIANA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 348

CONTRACTORS AND ENGINEERS

slopes. Its depth varies from 4 to 12 feet. Rainfall will seep through the random fill on the downstream side of the dike and find its way through the 4-foot blanket into the pervious random trench. At this point, the impervious clay material surrounding the trench forces the water through a gravel toe and into the drainage ditch. The gravel toe, 5 feet high on the downstream side of the dike, extends 17½ feet into the toe and has an outside slope of 2.5 to 1.

Seepage on the upstream side of the dike is virtually eliminated by the 500-foot-wide impervious blanket that extends upstream from the toe of the dike. The impervious fill of the dike itself will prevent seepage from the upstream slope to the downstream slope of the embankment.

The upstream slope of the dike will be protected from wave action in the future reservoir by the 24-inch-thick riprap blanket. This consists of rocks weighing from 15 to 200 pounds each; a 10 per cent allowance will be made for rock weighing between 200 and 300 pounds. The riprap will be placed on a 9-inch graded sand-gravel filter blanket that will be placed directly on the impervious fill of the upstream slope.

On top of the dike will be a 30-foot roadway, consisting of an 8-inch stabilized wearing surface course of sand,

clay, and gravel, that will link an existing county road to the powerhouse.

The powerhouse itself will house four generating units with a total capacity of 130,000 kw. The lock will be big enough to accommodate the largest tow capable of navigating the river and will have a maximum lift of 88 feet.

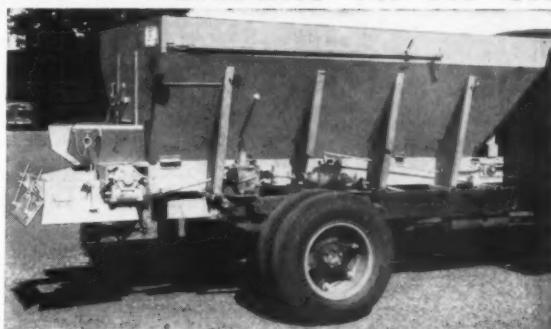
#### Part of project

This Fort Gaines project is part of a comprehensive 30-year plan designed to develop the water resources of three rivers—the Chattahoochee, Flint, and Apalachicola. Eventually, it will provide a 9-foot navigable waterway from the Gulf Intra-Coastal Waterway to Columbus, Ga., on the Chattahoochee, and from the waterway to Bainbridge, Ga., on the Flint. It will also help prevent flooding in the upper Chattahoochee River Valley, increase the water supply for the area—particularly for the metropolitan section of Atlanta—and generate about 818 million kilowatt-hours of hydroelectric energy per year.

The initial development involves dredging and channel work on the Apalachicola, and the construction of four dams: The Jim Woodruff Lock and Dam near Chattahoochee, Fla.; a lock and dam near Columbia, Ala.;

(Concluded on next page, col. 4)

## BURCH SPREADERS for Ice Control



Hopper-Type, Spinner-Type, power take-off or hydraulic operation, for sand, cinders, salt and calcium. Quickly and easily attached to truck. Write today to Dept. CE for literature.

**The BURCH Corporation**  
CRESTLINE, OHIO, U.S.A.  
MANUFACTURERS OF EQUIPMENT FOR CONSTRUCTION AND MAINTENANCE OF ROADS AND STREETS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 350

## MARVEL Synclinal FILTERS

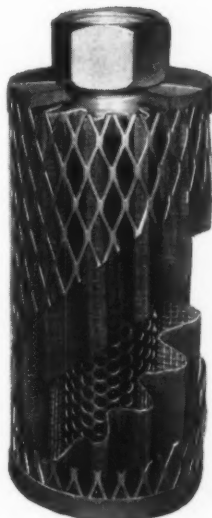
For Efficient Filtration of—

Hydraulic Oils—

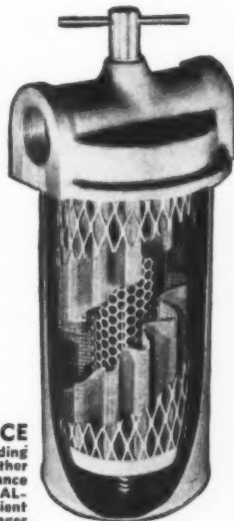
Fire Resistant Hydraulic Fluids—

Coolants—Lubricants—

Water



SUMP TYPE  
(cutaway)



LINE TYPE  
(cutaway)

OVER 700  
Original  
Equipment  
Manufacturers  
Install Marvel  
Synclinal Filters  
as Standard  
Equipment

### PROTECT EQUIPMENT — INCREASE PRODUCTION — REDUCE MAINTENANCE

Marvel Synclinal Filters installed in the sump or on the line preceding pump offer maximum protection on all hydraulically actuated and other equipment utilizing low pressure circulating oil systems. Maintenance and production costs are reduced because Marvel Synclinal Filters BALANCED design offers greater ACTIVE filtering area with sufficient storage capacity for filtered out damaging particles, thus, longer periods of productive operation are attained at minimum "down time" due to maintenance and repairs.

**CONSTRUCTION ENGINEERS and MAINTENANCE MEN** whose job it is to keep construction equipment operating at peak efficiency and who have recognized the superiority of Marvel Synclinal Filters in the filtration of hydraulic oils, fire resistant hydraulic fluids, coolants, lubricants, etc. are specifying Marvel Synclinal Filters on all new equipment and standardizing with Marvel Synclinal Filters on all existing equipment.

Another outstanding reason for their preference is the simple construction of Marvel Synclinal Filters which allows them to be easily disassembled, thoroughly cleaned and reassembled on the spot, by any workman in a matter of minutes. Line type operates in any position and may be serviced without disturbing pipe connections.

### A SIZE FOR EVERY NEED

Available for sump or line installation in capacities from 5 to 100 G.P.M. Greater capacities may be attained by multiple installations (as described in catalog). Choice of Monel mesh sizes range from coarse 30 to fine 200.

### IMMEDIATE DELIVERY

As in the past, Marvel continues to offer immediate delivery!

### MARVEL ENGINEERING COMPANY

7227 N. Hamlin Ave., Chicago 45, Ill.

Phone: JUniper 8-6023



Catalogs  
containing  
complete data  
available  
on request

Without obligation, please send me complete data on Marvel Synclinal Filters, as indicated:—  
☐ Catalog #107—For Hydraulic Oils, Coolants, Lubricants  
☐ Catalog #200—For Fire-resistant Hydraulic Fluids (Aqueous Base)  
☐ Catalog #400—For Fire-resistant Hydraulic Fluids (Synthetic)  
☐ Catalog #301—For Water

Name .....  
Company .....  
Address .....  
City .....  
State .....

For more facts, use coupon

**W**hen  
Abrasoweld and  
Faceweld ...

**H**andle  
9 out of 10 hard-  
surfacing jobs...

**Y**et cost  
less to buy...

**WHY**  
use anything  
else for  
hardsurfacing

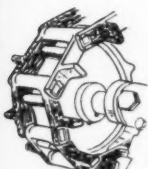
Got hardsurfacing  
jobs like these?



Drag Chain



Crow foot



Chain



Dipper Tooth

Speed 'em up with  
Lincoln rods...  
and cut your costs, too

#### Here's how:

For severe impact and moderate abrasion use Abrasoweld, a high alloy carbon chromium rod.

For severe abrasion and moderate impact use Faceweld, a high alloy chromium carbide rod.

WELDDIRECTORY SB-1352 has the facts.  
SEND FOR IT. Write Dept. 5310

### THE LINCOLN ELECTRIC COMPANY

Cleveland 17, Ohio

The World's Largest Manufacturer  
of Arc Welding Equipment

For more facts, use Reader-Reply Card opposite page 18 and circle No. 349

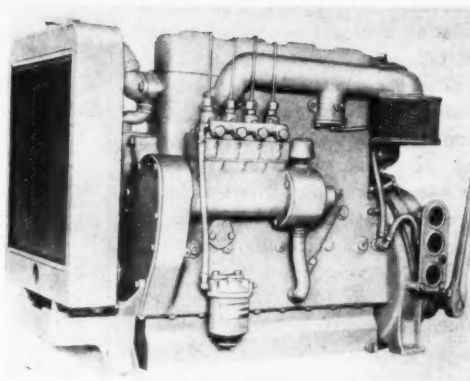
## New 42-hp diesel unit smaller than gas engine

■ A new Sheppard 4-cylinder diesel engine of 153.6-cubic-inch displacement is rated at 42 gross belt-horsepower at 2,000 rpm. The most noteworthy feature of the new diesel is its compact size; it occupies less space than gasoline engines of comparable ratings.

Intended primarily as replacement power where service conditions are too rugged for gasoline engines, the new Sheppard Model 19 is easily installed without alterations to driven machines. Like other Sheppard diesels, the new model is a 4-cycle engine featuring 22-to-1 compression ratio and a simplified fuel-injection system.

The new Model 19 is said to offer

The new Sheppard Model 19 diesel engine.



power users many big-engine design features for heavy-duty service in the lower power range. Wet-type replaceable cylinder liners, directional oil-cooled pistons, full-pressure lubrication, and trimetal precision-type bearings between each throw and at each end of the crankshaft are typical of its heavy-duty construction.

The new diesel is available as a fan-

tion, and trimetal precision-type bearings between each throw and at each end of the crankshaft are typical of its heavy-duty construction.

to-flywheel engine, an open power unit, a standard power unit, or a closed power unit. It is also offered as a 10, 12, or 15-kw generating set.

For further information write to R. H. Sheppard Co., Inc., 47 Middle St., Hanover, Pa., or use the Request Card at page 18. Circle No. 118.

## New span bar level made of magnesium

■ A magnesium span bar level that reads angles, slopes, and pitches, plus verticals and horizontals, is announced by Pickett Products, Inc. The tool is recommended for use by carpenters, masons, plumbers, and sheet metal workers. According to the company, it is accurate to a hairline.

The semi-floating plumb bob is sealed in a non-freezing liquid plastic that minimizes oscillation. The reverse side is calibrated in inch rise per foot. The Pickett span bar level is available in 18, 24, 30, and 48-inch lengths.

For further information write to Pickett Products, Inc., 1109 S. Fremont Ave., Alhambra, Calif., or use the Request Card at page 18. Circle No. 167.

(Continued from preceding page)

the Fort Gaines Lock and Dam; and the Buford Dam near Buford, Ga. All but the dam near Columbia will have power installations.

### Personnel

The Fort Gaines project was designed and is being constructed under the supervision of the Mobile District, U. S. Army Corps of Engineers, which has Col. Harold E. Bisbort as district engineer. Lavelle R. King is resident engineer for the Corps, and Martel McGuffin is superintendent for Moss Construction Co.

THE END

# Don't Stick Your Neck Out!



**New Hercules Front Mounted Telescopic Hoist Gives You 1000 lbs. Extra Legal Payload**

You can haul an extra half-ton of payload FREE on every trip by choosing the sensational new HERCULES Single Telescopic Hoist (Model 1210) for your heavy-duty dump truck bodies eleven to fifteen feet long.

This 20-ton capacity hoist pays for itself quickly because it weighs so much less . . . shifts more load to front axle . . . reduces driver cost per ton . . . and minimizes maintenance. Available for single or tandem axle straight trucks, Model 1210 mounts easily, no part extending below the truck frame.

For larger capacities, HERCULES builds Twin Telescopic Hoists with even greater payload-boosting advantages.

Act now to increase your profits. Write, wire or phone for complete information.

AA-3312

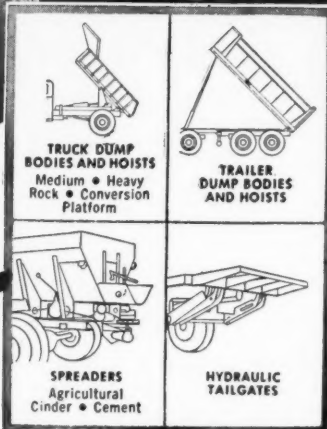


# Hercules

buy from the line of strongest design

HERCULES STEEL PRODUCTS COMPANY • GALION, OHIO

For more facts, use Reader-Reply Card opposite page 18 and circle No. 351



TRUCK DUMP BODIES AND HOISTS  
Medium • Heavy  
Rock • Conversion  
Platform

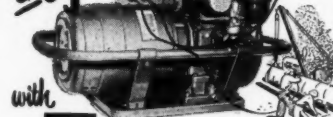
TRAILER DUMP BODIES AND HOISTS

SPREADERS  
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HYDRAULIC TAILGATES

**PORTABLE ELECTRIC POWER**

*Right on any job!*



with **Katolight**

**PORTABLE POWER PLANTS**

Right — you save time . . .

Right — you speed work . . .

because with Katolight Portable Power Plants, your crews have "plug-in" electricity instantly available to operate all types of tools, equipment and lights right on the job, whether it's highway, or light or heavy construction. Sizes and models, right for every portable, standby or continuous use, from 350 watts to 50 KW, AC. Up to 500 KVA on request.

**It's New!**

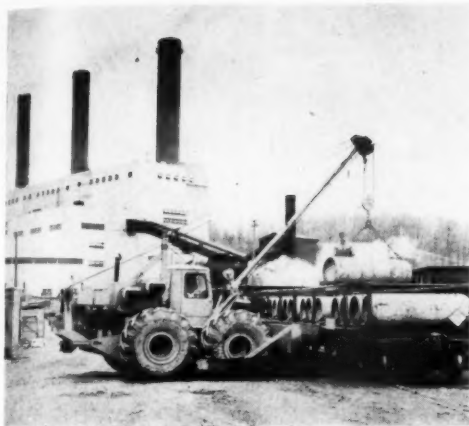
WRITE FOR FREE FOLDER ON NEW LIGHTWEIGHT PORTABLE MODELS

**Katolight CORPORATION**

Box 891-8, Mankato, Minnesota

For more facts, circle No. 352

CONTRACTORS AND ENGINEERS



The custom-built boom on a Model C Tournatractor unloads 3,000-pound cylinders of chlorine for the Indianapolis Power & Light Co. The attachment does not hamper ordinary dozer use.

### Tractor does extra duty with custom-built boom

A custom-built, electrically-operated boom added to a LeTourneau-Westinghouse standard rubber-tire Tournatractor has enabled Indianapolis Power & Light Co., to accomplish double and even triple the usual amount of work. The tractor not only handles dozing and pushloading jobs, but also does scattered maintenance and service work.

Built to function without hampering the ordinary use of the dozer blade the boom folds back when not in use. When it is extended, it provides a crane that can lift a weight of 3 or 4 tons at a reach of 10 to 14 feet.

Now in use at the White River Generating Station, Martinsville, Ind., the unit is being used to load and unload supplies and materials from trucks and for the pipe-handling operations involved in repairing and extending the plant's ash-disposal line.

Toll collections on the New York State Thruway, January through July, 1956, totaled \$11,596,013.49. This is slightly less than double the revenue collected in the same period last year, a sum amounting to \$6,187,414.65.



"It was owned by an old company that used it only to excavate for churches."

## SUB-ZERO CONDITIONS — WARM WEATHER COMFORT



On jobs where men work in extreme cold and wet weather, most companies equip crews with Bullard Winter Liners.

## BULLARD WINTER LINERS

### 5 types for all safety hard hats and caps



CAT. NO. 70-EL-33,  
MED. OR LARGE

Rugged, wind resistant and water repellent outside fabric with fleece or wool interior. Specify fleece or wool lining.



CAT. NO. 70-EL-38,  
MED. OR LARGE



CAT. NO. 70-WL-2K

Wool knitted caps in two styles: as snug, close fitting skull cap, or as elastic knit skaters' type that covers neck and ears.



CAT. NO. 70-WL-1K



Fabric and knit combination assures extra warmth and wind protection for ears, neck, head, and forehead.



CAT. NO.  
70-WL-3K

Arctic type liner, all wool knit. Protects head and face. Front slips down over mouth.

### UNIVERSAL SIZE

Fits all safety hats and caps

Fabric liner snaps over leather or leatherette sweatband, holding hat or cap firmly in place, maintaining full margin of safety protection.

Write for name and location of distributors in your area

**EVERYTHING  
BULLARD  
IN SAFETY**

T.M. REG. U.S. PAT. OFF.

**E. D. BULLARD COMPANY**  
275 EIGHTH STREET • SAN FRANCISCO, CALIFORNIA  
SINCE 1898

# RICE

The REALLY COMPLETE  
CONTRACTORS' LINE  
CENTRIFUGAL & DIAPHRAGM  
**PUMPS**

**CENTRIFUGALS**—All AGC Sizes  
1½" thru 10". Complete Line Light-  
weights. All Power Options.

**DIAPHRAGMS**—2", 3" and 4"  
and the Big Double 4". Coming Soon a  
Super-line of Straight Centrifugals.  
Nothing Finer.

Write  
for  
Bulletins

**RICE PUMP & MACHINE CO.**  
200 PARK AVE. • BELGIUM, N.Y.

For more facts, circle No. 353

For more facts, use Reader-Reply Card opposite page 18 and circle No. 354

## "BERG" CONCRETE SURFACERS FOR BRIDGES, DAMS, CULVERTS, HIGHWAYS, FLOORS, WALLS, AIRPORT RUNWAYS, AND OTHER APPLICATIONS



Portable  
Model A

Models H-8  
and H-10



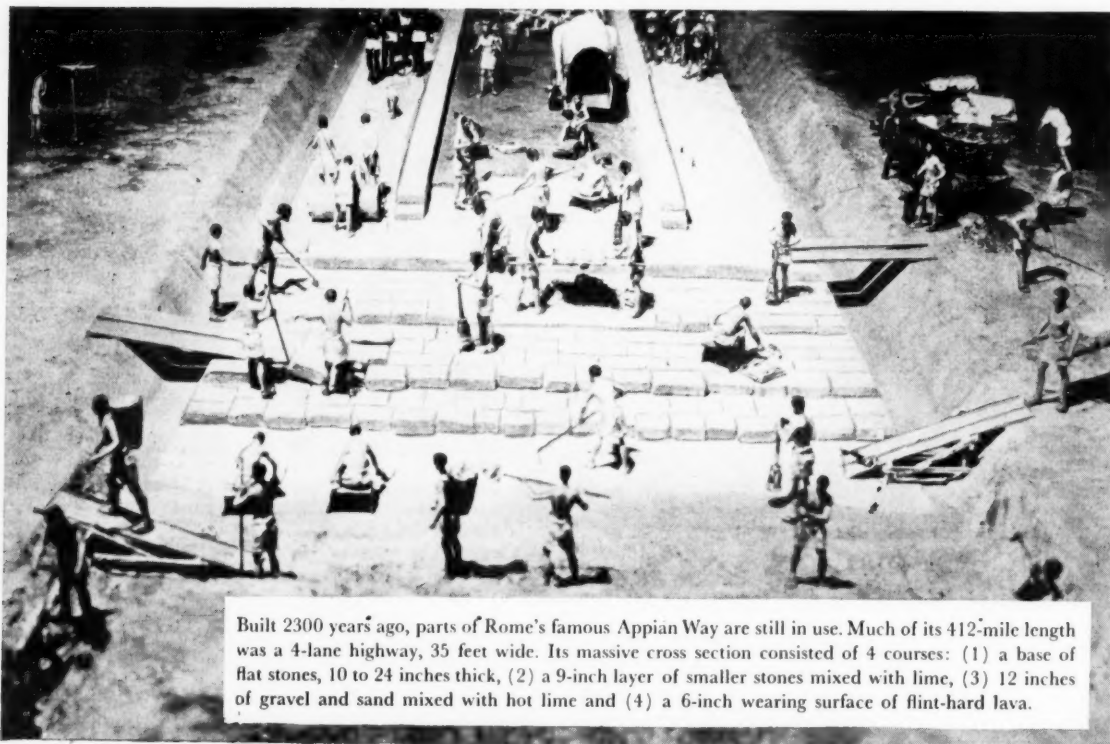
## "BERG" for Quality Work at Low Cost

MODEL A. Lightweight, electric powered unit . . . suspends from operator's shoulder. Interchangeable heads and attachments for surfacing concrete buildings, bridges, dams, walls, culverts, etc. MODELS H-8 and H-10. One-man gasoline engine powered units for surfacing concrete highways, streets, floors, airport runways. Includes exclusive power take-off for attaching "BERG" flexible shaft equipment for surfacing bridges, walls, etc. Write today for descriptive literature on machines and attachments.

**THE CONCRETE SURFACING MACHINERY COMPANY**  
4665-69 Spring Grove Ave., Cincinnati 32, Ohio

For more facts, use Reader-Reply Card opposite page 18 and circle No. 355

## Naugatuck SURFA-SEALZ



Built 2300 years ago, parts of Rome's famous Appian Way are still in use. Much of its 412-mile length was a 4-lane highway, 35 feet wide. Its massive cross section consisted of 4 courses: (1) a base of flat stones, 10 to 24 inches thick, (2) a 9-inch layer of smaller stones mixed with lime, (3) 12 inches of gravel and sand mixed with hot lime and (4) a 6-inch wearing surface of flint-hard lava.

Photo courtesy Bureau of Public Roads, Dept. of Commerce

**today  
there's  
a better  
way!**

IMAGINE THE COST of building highways like this today! Yet, for more than 2000 years, the construction methods of the Roman Empire's roadbuilders were the accepted standard. Only in the past century-and-a-half has there been a significant change. Modern methods, pioneered in England by John McAdam, discard the massive stone base and stress a relatively thin paved surface laid over a raised and compacted earthen subsurface.

Today, forward-looking roadbuilders are availing themselves of a more recent development which promises to further reduce the ultimate cost of highway construction and maintenance. They are adding to their bituminous surface courses small amounts of compatible *elastomeric* (rubber) hydrocarbons, such as Naugatuck's SURFA-SEALZ\*. This involves no extra equipment . . . adds little to the total cost of highway building or resurfacing . . . promises substantially longer paving life and greatly reduced maintenance!

Write for complete details on SURFA-SEALZ, the modern roadbuilder's strongest ally in stretching highway dollars!

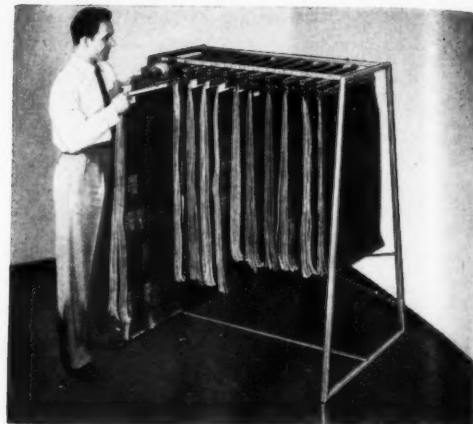
\*Registered Trademark



**United States Rubber**  
**Naugatuck Chemical Division**  
Naugatuck, Connecticut

BRANCHES: Akron • Boston • Chicago • Memphis • New York • Philadelphia • Mfg.: Naugatuck • Gastonia • Los Angeles • CANADA: Latex Div., Dominion Rubber Co., Ltd., Montreal • Cable: Rubexport, N. Y. Rubber Chemicals • Synthetic & Reclaimed Rubber • Plastics • Agricultural Chemicals • Latexes

For more facts, use Reader-Reply Card opposite page 18 and circle No. 356



Glider plan holders in 24, 36, and 48-inch lengths are now available for the Glider blueprint rack.

## Plan holder handles up to 100-page sets

■ Medium and extra-long blueprint holders are now available for the Glider blueprint rack, Momar Industries has announced. The new holders are 36 and 48 inches in length; heretofore, only a 24-inch holder was available.

The Glider plan holder is designed to accommodate up to 100 blueprints securely without damaging them. Any sheet in a set can be removed without disturbing the other sheets. The racks and holders are recommended for engineers and contractors at permanent or field offices.

The rack has a visible index that shows the content of each holder. The holders slide in and out on tracks. The rack and holders are constructed of steel.

For further information write to Momar Industries, 4323 W. 32nd St., Chicago 23, Ill., or use the Request Card that is bound in at page 18. Circle No. 107.

## Turnpike lighting

■ The different types of lighting for turnpikes and expressways are described in a catalog from General Electric. Lighting toll plazas, interchanges, service areas, bridges, tunnels, and underpasses with mercury, fluorescent, and filament luminaires is detailed. A plan of the installation system for each area is accompanied by a brief description of the type of lighting recommended. A section on lighting reference data covers such topics as the fundamental aspects and design objectives of lighting, and recommended lateral and vertical light distributions.

To obtain the catalog write to the Outdoor Lighting Department, Measurements & Industrial Products Division, General Electric Co., Spartansburg Highway, Hendersonville, N. C., or use the Request Card at page 18. Circle No. 39.

## L. B. Foster appoints

The Pittsburgh, Pa., firm of L. B. Foster Co., has appointed George R. Forbes, Jr., to the post of head of the pipe department. From offices in New York, N. Y., he will be responsible for the procurement and sale of pipe in the New York territory.

CONTRACTORS AND ENGINEERS



With a 1/4-yard backhoe attached, the Yumbo hydraulic shovel digs a trench.

### Versatile shovel has ball-bearing turntable

■ A hydraulic shovel with a ball-bearing turntable is being manufactured by Geco, Inc., under rights obtained from the Italian inventor of the rig. The turntable, utilizing two races of balls working in compression, is imported from a German firm.

The all-purpose Yumbo mounts on any truck of 2 tons or larger and can be used with the following attachments: a 1/4-yard backhoe, a 5/8-yard front dump bucket, a 3/8-yard rock bucket, a 5/8-yard gravel bucket, a 1/2-yard clamshell, and a 6,500-pound crane hook. One man can change attachments easily in 10 minutes, according to the company.

The turntable consists of lower and upper races, an integral gear and center race, and 168 ball bearings. The arrangement permits 360-degree continuous rotation in either direction. Virtually dustproof, it requires very little lubrication, the company reports.

The hydraulic system includes three double-acting cylinders, a hydraulic motor, four dual control valves, and a hydraulic pump. Steel swivel joints and high-pressure steel tubing eliminate rubber hose on the main working cylinders.

For further information write to Geco, Inc., 5701 Colorado Blvd., P. O. Box 177, Denver, Colo., or use the Request Card that is bound in at page 18. Circle No. 3.

### Announce half-track for industrial tractor

■ The Arps Corp. has announced that Arps steel and rubber-belted half-tracks are now available for the new Ferguson 40 tractor.

According to the manufacturer, Arps half-tracks are easily installed and removed, and give the tractor as much as 440 per cent added drawbar power when it is working under poor traction conditions. Maneuverability is greatly increased and travel speed is 7 to 8 mph faster than crawler tractors.

For further information write to the Arps Corp., New Holstein, Wis., or use the Request Card that is bound in at page 18 of this issue. Circle No. 155.

## ASK FOR INDUSTRIAL CABS...When Ordering Your Equipment



• Easily Installed • Easily Removed  
Ready Made for Your Make and Model Tractor

CONTACT YOUR  
EQUIPMENT DISTRIBUTOR



Canopy Type



Semi-Enclosed  
Fully Detachable

## INDUSTRIAL CAB COMPANY

36 Jefferson Avenue

PHONE 3959

Salem, Mass.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 357

# Quaker



**Rugged, non-twisting airhose  
for your toughest drilling  
and digging problems**



*Your fastest supply source is your industrial supply distributor. Save time by purchasing Quaker-Quaker Pioneer products through him. You'll find him prompt and efficient in meeting your regular needs—and mighty helpful when emergencies occur. Write for free brochure and name of your distributor.*

No matter what the job: boring into rock, breaking through shale, biting into concrete . . . no matter what the weather: wet, frigid or torrid . . . this tough air hose gives the utmost in stamina, dependability and easy handling.

Size for size this hose is stronger than other hose of equal capacity. Though light weight for easy handling, it will not snake or twist under pressure. Stands up to dragging over jagged surfaces, resists oil damage and withstands cracking at temperatures as low as -40°. Tube is non-porous and oil-resistant. On almost any hose installation you count on excellent performance with this hose—part of a proven line of rubber products, including belting, packing, and moulded rubber for every use.

**H K P**  
DIVISIONS OF  
H. K. PORTER COMPANY, INC.

**H. K. PORTER COMPANY, INC.**  
**QUAKER RUBBER DIVISION**  
**Philadelphia 24, Pa.**

**QUAKER PIONEER RUBBER DIVISION**  
**San Francisco 7, California**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 358

## Euclid appoints salesman

The Euclid Division of General Motors Corp., Cleveland, Ohio, has named Spencer T. Wyndham to the post of district sales representative in territories covered by P. L. Crooks & Co. in Oregon and Washington; Evans Engine & Equipment Co., in Washington and Alaska; and Dietrich-Collins Equipment, Ltd., British Columbia and the Yukon Territory.

Wyndham will make his headquarters in Seattle, Wash.

## Sales territory assigned to Iowa representative

Fred Dolton has been named district sales representative in the New England states and in metropolitan New York for the Cedar Rapids line of aggregate producing and bituminous

## Build center island mound on Garden State Parkway

A safety mound, reaching 4 feet above pavement height to reduce the glare of headlights from on-coming traffic, has been halfway completed on a 7½-mile strip of the state-owned section of the Garden State Parkway in New Jersey. Most of the 164-mile Parkway already has a wide center island with much vegetation. The current mounding project will involve placing vines as ground cover.

mixing equipment made by Iowa Mfg. Co., Cedar Rapids, Iowa. Dolton was formerly project engineer in sales development for Hewitt Robins, Inc. of New York, N. Y.



## Model 140 Cleveland Trencher helps get \$14,000,000 sanitary sewer construction program underway in St. Petersburg, Fla.

The Cleveland Trencher Model 140 shown above—one of three Clevelands currently being operated by Richards Constructors of Andalusia, Ala.—is completing a 400-foot run of trench on Snell Isle Blvd. in St. Petersburg. 8-inch cast iron pipe is being installed here for lift pump lines. Richards really had "trench on tap" for this job because of the exclusive wide range of digging speeds provided by his 140. This allowed him to open up just the trench footage needed at any time to meet the pipe gang's require-

ments. When more trench was needed, the speed to produce it "right now" was available in the Cleveland's reservoir of speeds—a reservoir of more than 33 usable combinations of digging wheel and crawler speeds, ranging from 6 inches to over 37 feet per minute.

Richards Constructors know that no matter what the digging conditions may be on their next job—hard or soft, wet or dry, shallow or deep—their Clevelands have what it takes to get the job done with 100% efficiency.

Talk it over with your Cleveland distributor

### THE CLEVELAND TRENCHER CO.

20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO



For more facts, use Reader-Reply Card opposite page 18 and circle No. 359

## Offer electronic scales, weigh-batching units.



This Fairbanks-Morse EPC control console automatically controls batching by means of a punched-card system.

■ A complete line of weighing instruments representing a new concept in fast, accurate weighing and weigh batching has been announced by Fairbanks-Morse & Co. Employing electronic load cells, the new instruments are said to assure accuracy and faster weighing, as well as offer convenience of remote weight indication.

Two basic types of electronic scales are offered: the Full Electronic, in which load cells replace the conventional lever system; and the Levetronic, in which a conventional lever system is used but with a load cell hooked in tension in the steelyard rod. The Levetronic system can be used to convert existing full mechan-

ical scales to electronic weighing and instrumentation.

Standard instruments include the Model CR, which incorporates such features as automatic balance detection, hold or memory circuit, automatic ranging, zero balance knob, net-gross switch, and printer with selective "print" and "weigh" buttons. The Model C instrument is similar except that it is not furnished with a printer or net-gross switch. The Model CW instrument is similar to the Model C but is furnished for wall mounting.

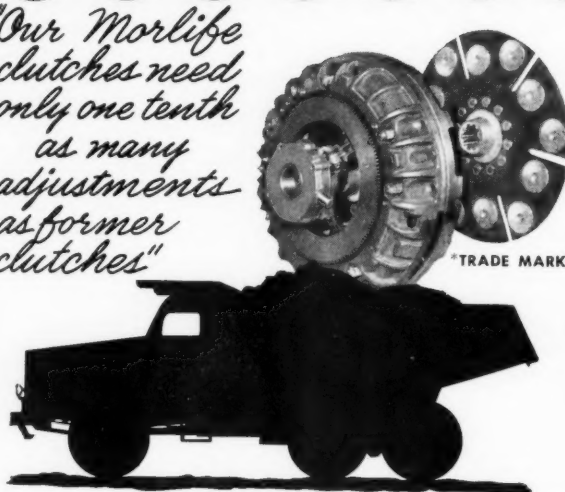
The Model CDO instrument is primarily designed for use where data-processing equipment is used.

In addition to electronic scales, the new Fairbanks-Morse line includes two reportedly unique electronic weigh-batch control systems. The Batchetron is an electronic control system for batch weighing of any type of material that can be handled into the batch hopper by piping, conveyors or belts, or from overhead supply bins where materials are controlled by gates or valves.

The Fairbanks-Morse EPC—Electronic Program Control—is an automatic batch-control unit that operates from a prepunched card. Formulas are punched on a card and the card dropped into a card reader slot on the instrument. The EPC "reads" the

## ROCKFORD

*"Our Morlife clutches need only one tenth as many adjustments as former clutches"*



## New MORLIFE\* CLUTCHES and CLUTCH PLATES Give-

**MORE Clutch Life (400% MORE)**  
**MORE Torque Capacity (100% MORE)**  
**MORE Heat Resistance (50% MORE)**

These new ROCKFORD Clutches and Clutch Plates have been developed by ROCKFORD Clutch Engineers to take full advantage of recently discovered facing material. Actual field tests on heavy duty equipment have resulted in adoption of MORLIFE clutches by builders of tractors, earth movers, graders, shovels, cranes, trucks, oil field equipment and power units. For information how these new Rockford MORLIFE Clutches will improve the operation and increase on-the-job hours of heavy duty machines, write Department E.

### ROCKFORD Clutch Division BORG-WARNER

314 Catherine Street, Rockford, Illinois, U.S.A.

Export Sales Borg-Warner International—36 So. Wabash, Chicago 3, Ill.

## CLUTCHES

For more facts, use Reader-Reply Card opposite page 18 and circle No. 360

CONTRACTORS AND ENGINEERS

card and automatically selects the right ingredients, weighs them in the weigh batch hopper, and discharges them to process equipment.

For further information write to Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill., or use the card at page 18. Circle No. 123.

#### Prefabricated forms

Job photographs showing the various uses of Uni-Form panels are incorporated in a booklet from Universal Form Clamp Co. Some of the applications for the panels are sewage treatment plants, bridge piers and abutments, culverts, columns, and y-walls. The three assembly steps are pictured and described.

To obtain the booklet write to the

Universal Form Clamp Co., 1238 N. Kostner Ave., Chicago 51, Ill., or use the Request Card at page 18. Circle No. 66.

#### Offer safety signs for construction use

A new line of eye-catching safety signs and equipment designed for construction projects has been announced by Eastern Metal of Elmira.

Designed to help prevent traffic accidents at the site of construction and repair jobs, these new signs have a large variety of legends applicable to such projects. Safety signs with special warning messages and directional information to eliminate confusion have also been added to the list.

According to the manufacturer,



One of Eastern Metal's new traffic control signs for construction projects.

particular attention has been given to the design and placement of the lettering so that the signs can be read quickly. The colors are bright and

striking, and the message stands out. Made of steel, these signs have a flexible baked-enamel finish to resist weather, vandalism, stone bruises, and other destructive elements.

For further information write to the Traffic Sign Division, Eastern Metal of Elmira, Inc., 130 Harrison St., Elmira Heights, N. Y., or use the Request Card at page 18. Circle No. 101.

#### Wooldridge warehouse

As part of its long-range expansion program, Wooldridge Mfg. Division, Continental Copper & Steel Industries, Inc., has opened a new factory parts warehouse at Melrose Park, Ill. Similar facilities were established this year in New Jersey and Georgia.

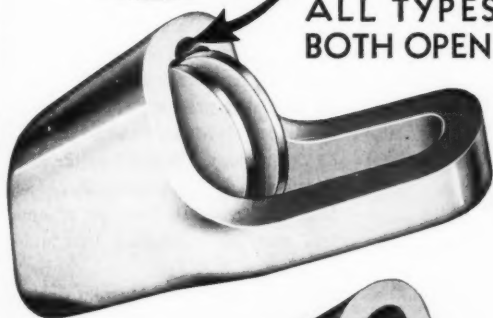
## FARRELL-CHEEK

FOR A FULL LINE OF

### WIRE ROPE SOCKETS

ALL TYPES AVAILABLE BOTH OPEN AND CLOSED

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CONTOUR  
ROPEWAY



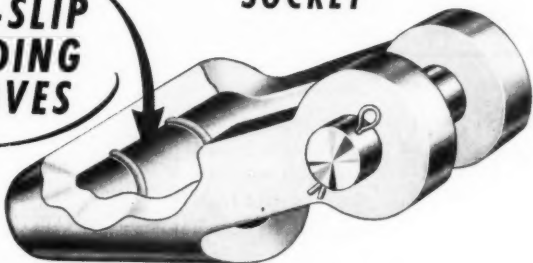
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STANDARD  
WEDGE  
TYPE  
SOCKET



NON-SLIP  
BONDING  
GROOVES

STANDARD TYPE  
SOCKET



WRITE TODAY FOR WIRE ROPE FITTINGS AND ACCESSORIES CATALOG NO. 22

### FARRELL-CHEEK STEEL CO.

HIGHEST QUALITY ELECTRIC FURNACE CARBON AND ALLOY STEEL CASTINGS

FARRELL'S CARBON STEEL CASTINGS	RAILROAD CASTINGS Locomotive and Car R. R. Specialty Castings	GEARS AND PINIONS "True Tooth" Gears and Pinions, Shafts and Wheels.	STOKER PARTS Feed Screws, Furnace Tools, Flanged Pipe, etc.
F-C HARD EDGE STEEL CASTINGS	ELEVATOR, CONVEYOR PARTS Sprockets, Traction Wheels, Chains, Buckets, Rollers, Idlers, Bushings.	CRANE WHEELS Overhead, Gantry, Monorail, Ingot Car, Charging Machine.	HEAVY HARDWARE Complete Line Wire Rope Fittings and Cutters, Bar Benders and Cutters.

YOUR INQUIRY WILL PROMPTLY BRING DETAILED INFORMATION PERTAINING TO ANY OF THE ABOVE FARRELL-CHEEK PRODUCTS

SANDUSKY, OHIO

## Rome Disk Plowing Harrows



Rome Master Disk Plowing Harrow takes a deep cut, turning material over so that excess moisture can evaporate.

## BUILD *ideal* SUBBASE for roads, airports and dams

For faster, more efficient pulverizing, aerating, blending and stabilizing of subbase materials put a Rome Disk Plowing Harrow on your job! Here's the weight and design to cut deep — pulverizing action to thoroughly mix the subbase and return material to its original position — free from ruts or windrows — the ruggedness to match the power of the largest crawlers.

Rome Disk Plowing Harrows are ruggedly-built for heavy-duty construction work. Massive main frames hold gangs level and make them penetrate uniformly. Super-strong bearings — your choice of Timken Roller or White Hard Iron — hold blades rigidly in position, provide easy rolling action. Notched blades are the finest made to withstand the punishment of rocks and stumps. Rome Disk Plowing Harrows are available in a variety of widths, in both offset and Rome Master Tandem. You have your choice of mechanical, hydraulic or cable control angling methods as well as wheel-type offsets in certain sizes.

Get all the facts at your Rome-Caterpillar Dealers.

ROME PLOW COMPANY, Cedartown, Georgia

YOUR ROME DEALER IS YOUR CATERPILLAR DEALER

For more facts, use Reader-Reply Card opposite page 18 and circle No. 362

For more facts, use Reader-Reply Card opposite page 18 and circle No. 361

## manufacturer memos



H. R. Loxterman, the new general sales manager of the equipment division of Blaw-Knox Co.

### Blaw-Knox names new general sales manager

The new general sales manager of the equipment division of Blaw-Knox

Co., Pittsburgh, Pa., is H. R. Loxterman. Assistant sales manager of the equipment division since 1952, Loxterman succeeds Arthur A. Levison. He will continue as sales manager for steel plant equipment in addition to his new duties.

The firm, manufacturer of steel forms for the construction industry, and of clamshell buckets, also named Edward W. Pottmeyer to the post of manager of the division. He had been chief product engineer for the steel plant equipment department.

### Detroit Diesel names new general manager

Clyde W. Truxell has been appointed to succeed Semon E. Knudsen as general manager of the Detroit

Clyde W. Truxell, recently elected head of the Detroit Diesel Engine Division of General Motors Corp.



Diesel Engine Division of General Motors Corp., Detroit, Mich. The former works manager of the division, Truxell has been associated with the firm since 1932.

He has also served as head of the division's inspection department and as director of engineering and sales for the Diesel Equipment Division in Grand Rapids, Mich.

### Massey-Harris-Ferguson makes seven appointments

Massey-Harris-Ferguson, Ltd., Toronto, Canada, parent organization of Massey-Harris-Ferguson, Inc., of Racine, Wis., has appointed E. P. Taylor chairman of the executive committee of the board of directors.

Six other executive appointments were also made. A. A. Thornbrough has been named a director in charge of operations of the company, its divisions, and subsidiaries. H. G. Kleram has been appointed vice president in charge of engineering for the parent firm and all divisions; C. P. Milne will become vice president and general manager of M-H-F, Inc., Racine.

M. F. Verity and W. Lattman have been named group vice presidents, Verity taking charge of over-all operations in Australia, South Africa, and for two Canadian firms. Lattman will be responsible for the Eastern Hemisphere division.

The new vice president in charge of finance is C. F. Hammeyer, and J. W. Vingoe is now director of planning and procurement.

### New England Carbide elects new president

The former executive vice president and general manager of the New England Carbide Tool Co., Inc., Medford, Mass., Bernard L. Chapin, has been elected president of the firm. A graduate of Massachusetts Institute of Technology, he is a director of the Cutting Tools Manufacturers Association, the Research Institute of America, and the American Institute of Marketing.

New England Carbide manufactures a complete line of carbide-tipped masonry bits and a carbide-jewelled knife sharpener.

### Goodyear appoints Morris, makes four promotions

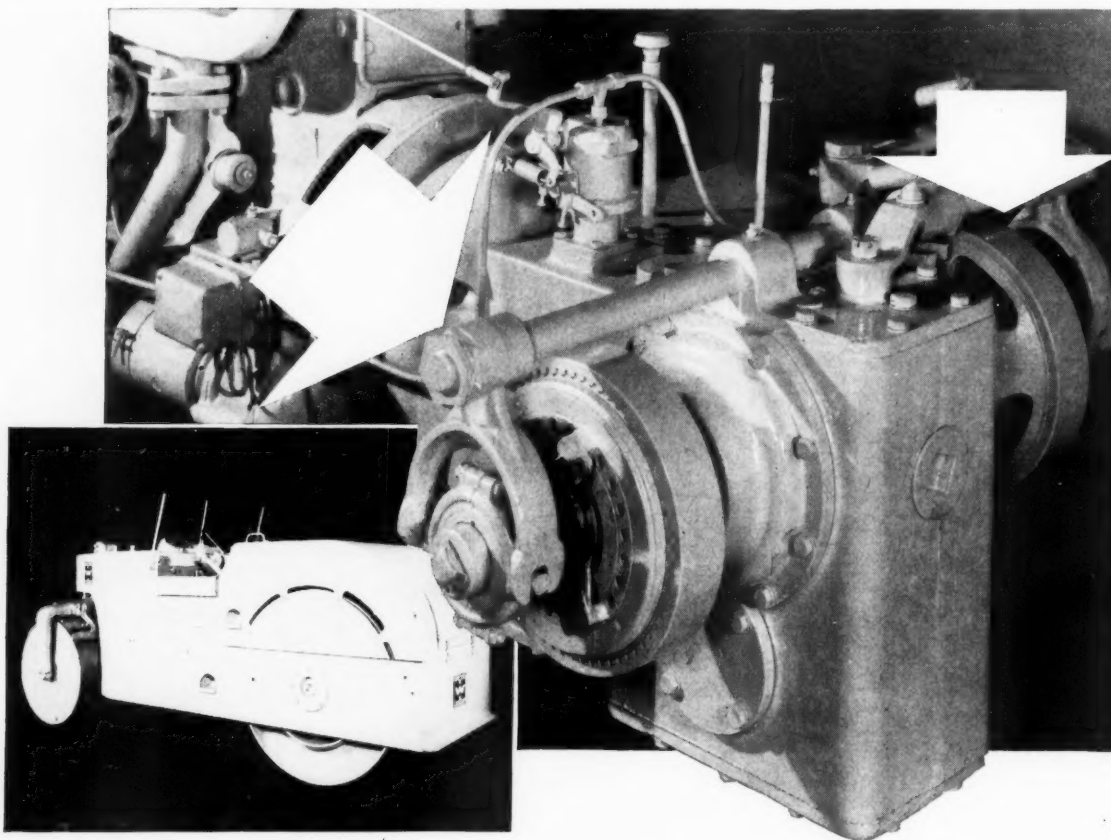
A number of personnel changes have been made by the Goodyear Tire & Rubber Co., Akron, Ohio. The new assistant general traffic manager for the firm is J. B. Morris. He started with Goodyear in 1925 and since then has held a number of posts in production control and merchandise distribution.

Four men have also been promoted to the positions of traffic managers of various divisions. R. J. Hoskins holds the post in the passenger and claims division; S. A. Brigam in the rate and audit division; C. C. Harless in coordination division; and D. F. Brain in the import and export division.

### Master Builders promotion

Appointed vice president of operations and administration of the Master Builders Co., Cleveland, Ohio, is William B. Phillips, who has served the firm in various executive capacities since 1946.

Phillips will be responsible for manufacturing, purchasing, and traffic activities, and will continue in his former post of vice president of administration for the firm.



## New HUBER-WARCO Tandem Rollers STANDARDIZE on TWIN DISC CLUTCHES!

To obtain smooth, trouble-free control of forward and reverse, the Huber-Warco Company standardized on Twin Disc Model CL Clutches for their new line of medium and large size variable weight tandem rollers.

Four models are included in the new line—the medium sized 5-8 and 8-10 ton rollers and the large 8-12 and 10-14 ton tandems—all of identical design.

Rugged, heavy-duty, fully-enclosed Twin Disc Model CL Clutches were designed into each model for several

important reasons. They are unusually compact . . . provide easy, single point adjustment . . . designed for smooth acceleration, and take hold without grabbing . . . excess clamping force assures a firm grip when the clutch is fully engaged . . . provide excellent heat absorption and dissipation ability to protect the clutch faces from damage or distortion.

For these reasons, Huber-Warco has standardized on Twin Disc Clutches for the past 13 years. If you want a smooth, dependable transmis-

sion of power to your equipment, get all the facts on the Twin Disc Model CL Clutches—offered with one, two or three friction plates, in sizes from 5.5" to 11.5". Write Twin Disc Clutch Company, Racine, Wis. Request Bulletin 120-D.



TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • HYDRAULIC DIVISION, Rockford, Illinois

BRANCHES OR SALES ENGINEERING OFFICES: CLEVELAND • DALLAS • DETROIT • LOS ANGELES • NEWARK • NEW ORLEANS • TULSA

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William J. Kirchner, the new chief engineer of Heltzel Steel Form & Iron Co.

#### Heltzel names engineer

The Heltzel Steel Form & Iron Co., Warren, Ohio, has appointed William J. Kirchner as chief engineer of the firm. He succeeds Fred Mittelstadt, who has retired.

With the firm for the past seven years, Kirchner has also served as design engineer, field engineer, and supervising engineer.

#### Clark appoints three to engineering posts

The Clark Equipment Co., Buchanan, Mich., has named three men to engineering positions within the firm's axle division. L. M. Gray, former assistant to the chief engineer, has been promoted to chief engineer.

G. C. Vanderberg, the former chief engineer, has been named engineering consultant to the division's vice president. The new development engineer is William E. White. He had been product engineer in charge of brake specification.

#### U. S. Steel division promotes two executives

Two shifts in executive personnel have been made by the American Bridge Division of U. S. Steel Corp., New York, N. Y. John H. Long, assistant to the vice president in charge of contracting for the division, has been transferred to the New York office. Walter Schielke, contracting manager at Birmingham, Ala., has taken Long's post as assistant to the vice president in charge of contracting.

#### H. L. Kociencki joins Marlow Pumps

Harry L. Kociencki has joined the sales staff of the Marlow Pumps Division of Bell & Gossett Co., Ridgewood, N. J. A graduate of Stevens Institute of Technology, Kociencki was formerly an application engineer in the vertical turbine pump division of the Worthington Corp.

In his new post Kociencki will handle contacts with dealers and distributors from the Midland Park office.

#### Murphy manages new Intrusion-Prepakt office

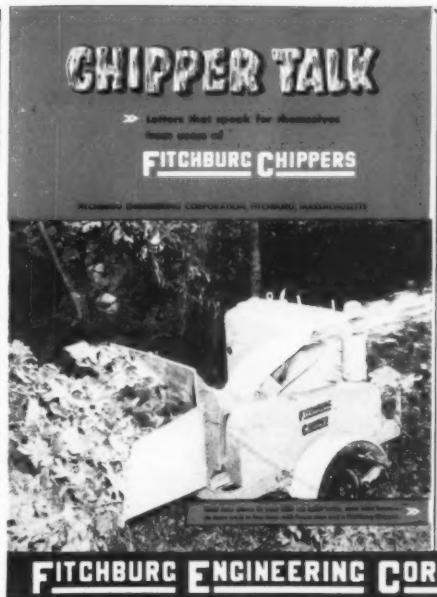
The recently established New England district office of Intrusion-Prepakt, Inc., Cleveland, Ohio, is being managed by Richard D. Murphy, a former bridge maintenance engineer for Massachusetts.

From his headquarters at 459 Statler Office Building, Boston, Mass., Murphy will supervise field sales and construction activities.

#### Koehring makes two appointments

Irvin L. Gebhard has been appointed general manager of Koehring Co. of California, a west-coast subsidiary of the Koehring Co., Milwaukee, Wis. He will be in charge of all services to users of the Koehring line of heavy-construction machinery in the eleven western states. He will also direct the manufacture of some parts and equipment manufactured and designed in California.

Donald C. Kilpatrick has been named parts sales-promotion manager for the Koehring Co. To be responsible for all phases of operations within the parts department, Kilpatrick will make his headquarters in Milwaukee.



## FREE PORTFOLIO

Big book tells how you can save TIME, LABOR, WAGES, with rugged

## FITCHBURG CHIPPERS

Complete cutaway drawings of Fitchburg Chipper mechanism in action, specifications, pictures, diagrams, letters from leading companies—cities. Write on your letterhead. Department CE-96.

FITCHBURG ENGINEERING CORPORATION

FITCHBURG MASS.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 364

# TDA<sup>®</sup> BRAKES

*if it moves...we can stop it!*



Better control  
for the  
"heavyweights"

## NEW TIMKEN-DETROIT<sup>®</sup> HEAVY-DUTY "P" SERIES POWER BRAKES

No earth mover is any better than its brakes. Dependable control is indispensable on all big construction vehicles. So it's important that manufacturers specify brakes that are large enough, safe and durable. No contractor can afford to have essential earth moving equipment side-lined because of brake problems.

Now! Timken-Detroit Brake Division offers the new Heavy-Duty "P" Series Brakes to give manufacturers greater dependability . . . better control . . . and longer service.

The "P" Series Brake utilizes a unit-mounted design that offers a self-contained, compact assembly. Camshaft and air chamber support brackets are mounted directly onto the brake spider. (Inboard chamber mounting design is also available.)

Temperatures during operation are lower and liner life is longer because of the open-type spiders

which assure good internal ventilation and rapid cooling. Timken<sup>®</sup> 3/4" "Econo-liners" are tapered to provide greatest thickness where most wear occurs . . . less waste material at reline.

Other features of new "P" Series Brakes: heat-treated, malleable iron brake shoes . . . securely riveted brake linings . . . constant lift S-type, heat-treated cam . . . sealed, needle bearing camshaft mountings . . . long-life bronze bushings in anchor-pin holes . . . hardened, rust-proofed anchor pins.

"P" Series Brakes are available in a complete range of capacities and sizes to fit every operating requirement. For expert consultation, contact Timken-Detroit Brake Division. Complete specifications and information on "P" Series Brakes are available. And a staff of experienced engineers is ready to assist you with any problem you may encounter.



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For every industrial, agricultural or automotive application where braking is required!

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 365



The Etnyre Model BX Black-Topper.

### Bituminous distributor handles heaviest grades

■ E. D. Etnyre & Co. has announced the new Model BX Black-Topper bituminous distributor.

Described as a strictly functional distributor, the Model BX is said to offer substantial savings in original cost, truck investment, and tires. Yet,

the manufacturer reports, it has the same compact circulating system offered on other Etnyre Black-Toppers, as well as the same positive control of application rate, accurate material distribution, reliable performance, and economical operation.

The new distributor is designed to handle all types of bituminous materials, including heaviest grades.

Tank sizes range from 800 to 4,000-gallon capacities. Each size model is complete with 375-gpm pump, front or rear engine mounting, generating-type or low-pressure burners, full 8-inch flues, and all necessary controls and accessories. Special features for greater convenience, safety, and accuracy are available as extras.

For further information write to E. D. Etnyre & Co., Inc., Oregon, Ill., or use the Request Card at page 18. Circle No. 90.

Highway users in the United States paid \$4,025,693,000 in state highway use taxes in 1955.



The M-S-A Drildust bucket is a device for collecting dust during overhead rotary drilling when fluted augers are used.

### Device collects dust in overhead drilling

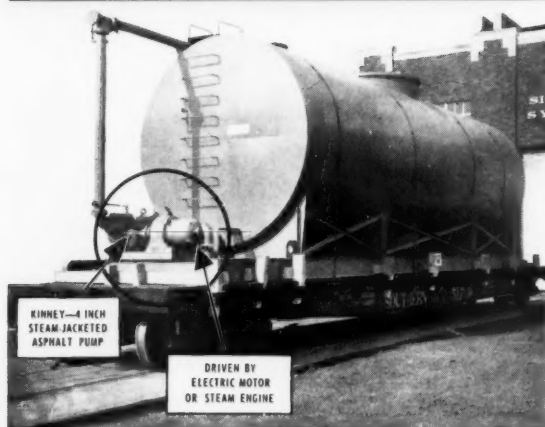
■ A device for collecting dust in overhead drilling operations in tunnels is available from the Mine Safety Appliance Co. The M-S-A Drildust bucket provides a portable method of dust collection for overhead rotary drilling where fluted augers are used.

The device consists of a rubber hood, a collecting bucket, and a hanger assembly, all of which slide over the drill. Dust created by the drilling falls into the bucket, which remains in contact with the roof.

The bucket does not interfere with normal drilling operations, whether directly overhead or diagonally upward, the manufacturer states. No external power is required for operation. The device is recommended for use where bolt holes are being drilled in a tunnel roof.

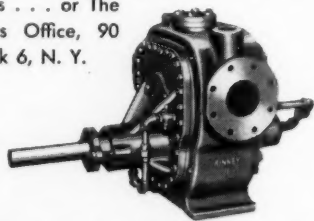
For further information write to the Mine Safety Appliances Co., 201 N. Braddock Ave., Pittsburgh 8, Pa., or use the Request Card at page 18. Circle No. 154.

### Designed for **RUGGED** Asphalt Service!



Exclusive choice for over 31 years . . . that is the amazing record that Kinney® asphalt pumps have with The Simplicity System Company, Division of West Construction Co., Chattanooga, Tennessee. Kinney pumps are used on all Simplicity asphalt plants, pug mill mixers, storage tanks, etc. . . because these Model SD Rotating Plunger Pumps are specifically designed to handle asphalt with unusually high suction ability. Simple in design, rugged in construction, with no valves, blades, springs or vanes . . . they deliver difficult-to-handle liquids with meter-like accuracy.

Our engineers will gladly make recommendations on your particular pumping requirements. Contact one of our competently staffed district offices . . . in Baltimore, Charleston, W. Va., Charlotte, N. C., Chicago (La Grange), Cleveland, Detroit, Houston, Los Angeles, New Orleans, New York, Philadelphia, Pittsburgh, San Francisco, St. Louis . . . or The International Sales Office, 90 West St., New York 6, N. Y.



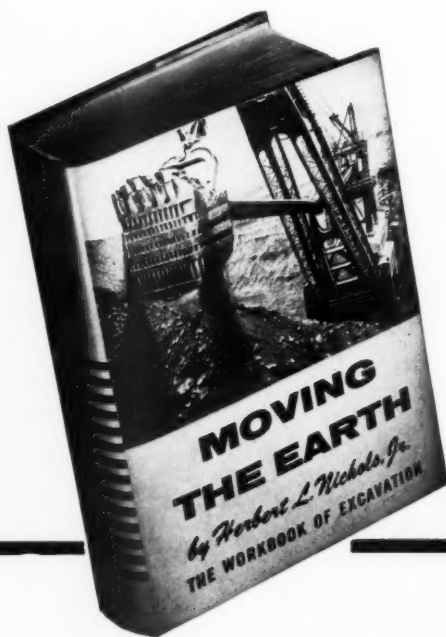
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For more facts, use coupon or circle No. 366



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Written by a contractor of twenty years' experience who is a recognized authority in this field. MOVING THE EARTH contains detailed descriptions of exactly what operations the excavating contractor must perform on literally hundreds of different jobs. You'll also find in it a wealth of information on the operation, maintenance, and repair of just about every machine used in excavating work.

MOVING THE EARTH contains 1,200 pages and 1,200 photos that can show you the way to lower costs through more efficient operating methods that will also produce better work. The enormous scope of this book—truly "A Workbook of Excavation"—is indicated by the 15-page table of contents listing hundreds of topics.

21 chapters are divided into 2 parts. Part One deals with the work—describing every operation from digging a cellar to grading a superhighway. Part Two describes every important type of excavating and earthmoving machine—how it is made and why, what it will do and how to run it, and—above all—how to take care of it.

You may obtain your copy, on approval, from:

Book Order Department

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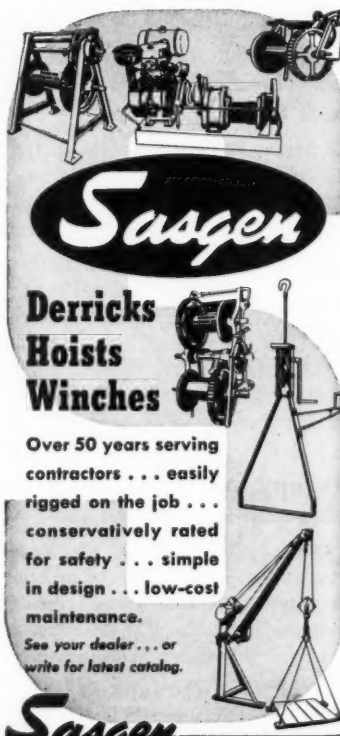
470 Fourth Ave., New York 16, N. Y.

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MOVING THE EARTH

Published by North Castle Books, Greenwich, Conn.

For more facts, circle No. 1



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Over 50 years serving  
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for safety . . . simple  
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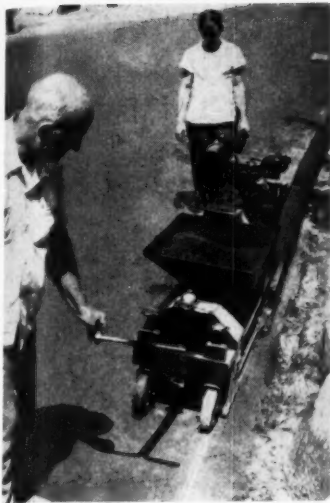
See your dealer . . . or  
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**Sasgen**

**DERRICK COMPANY**  
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For more facts, circle No. 368

**CONTRACTORS AND ENGINEERS**



The Etnyre heavy-duty automatic curb paver lays compact bituminous curbing at rates from 4 to 6 fpm.

### Automatic curb paver does away with forms

■ A heavy-duty automatic curb paver that is said to lay 90 per cent compacted bituminous curbing in one pass and to eliminate the need for forms is announced by E. D. Etnyre & Co., Inc. The machine is self-propelled.

The paver utilizes exhaust from its own engine to preheat and blast-clean the surface on which the curbing is laid, in many cases eliminating the need for a tack coat. Speeds of from 4 to 6 feet of curbs per minute are possible depending on the compaction desired, size of mold, and consistency of material.

Operated by two men, the paver is designed so that it cannot be jammed by overloading. The material screw and screw sleeve are made in replaceable sections. A variety of interchangeable molds are available. While in operation, the machine is propelled by action between the screw and the curb that is being laid.

For further information write to E. D. Etnyre & Co., Inc., Oregon, Ill., or use the Request Card at page 18. Circle No. 27.

### Three-wheel roller

■ The Roll-O-Matic 3-wheel roller manufactured by Galion Iron Works & Mfg. Co. is described in a new catalog. The roller, available with non-ballasted spoke-type or ballasted drum-type rolls, comes in weight sizes from 10 to 16 tons. Data is included on design and construction features, weight distribution, compression ratings, and attachments.

To obtain Catalog No. 410 write to Galion Iron Works & Mfg. Co., Galion, Ohio, or use the Request Card at page 18. Circle No. 147.

### Baker-Raulang branch

The Baker-Raulang Co., Cleveland, Ohio, has opened a Chicago factory branch office at 5627 S. Harlem Ave., Chicago. The firm, maker of gas and electric material-handling trucks, has named Jack Hiltibrand manager. The new branch will be stocked with all items required to service the company's line of Shovel loaders, Trave-loaders, etc.

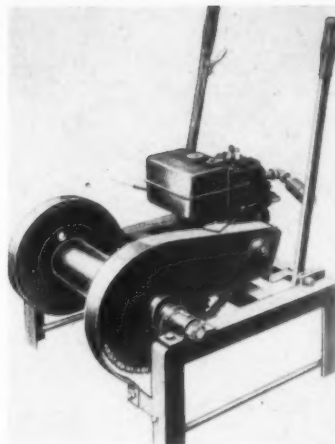
The King Jr. Model 150 hoist, product of the King Mfg. Corp.

### New "vest pocket" hoist for smaller projects

■ The King Mfg. Corp. has introduced the King Jr., an economical, light-duty hoist for use on smaller construction jobs such as single-story industrial plants, commercial buildings, and the like.

The unit weighs only 160 pounds. Two men can readily lift it on or off a truck. It will hoist roofing materials, plaster, lumber, and other building materials.

The King Jr. hoists 200 pounds at 200 fpm, and can be geared to hoist



350 pounds at 100 fpm. The spool or drum holds 300 feet of 1/2-inch manila rope or 130 feet of 3/4-inch rope. The

engine develops 2 horsepower at 300 rpm.

For further information write to the King Mfg. Corp., 3138 W. Chicago Ave., Chicago 22, Ill., or use the Request Card at page 18. Circle No. 85.

### Penetrating oil

■ Nu-Aero, a spray-type penetrating oil containing molybdenum disulphite, will loosen frozen nuts, bolts, fittings, and sheaves, according to a folder from the Pressure Products Co. Job photos show the use of the preparation, which is ejected from an aerosol can in a 4-foot stream.

To obtain the folder write to Pressure Products Co., P. O. Box 342, West Chester, Pa., or use the Request Card at page 18. Circle No. 59.

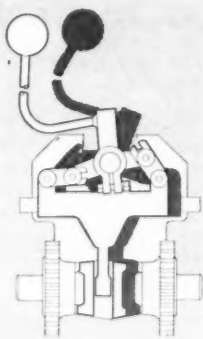
## Report from the Dallas-Fort Worth Turnpike Job



"The Allis-Chalmers Forty Five motor grader has the

### BEST CONTROLS I'VE EVER TOUCHED"

That's what veteran motor grader operator R. C. Fryer of Telephone, Texas, says about the new mechanical, toggle-type control levers on the Allis-Chalmers Forty Five motor grader he is operating for the J. C. Watson Construction Co., Dallas, Texas.



And here's why Fryer is so enthusiastic. Toggle-type controls move gears into operating position surely, quickly when operator moves lever . . . but with no wrist-snapping kick-back. Levers stay put—can't fight back. With no backlash to worry about, Fryer does precision jobs faster and easier.

### You've got to see it to believe it

R. C. Fryer is a veteran of the four-mule Fresno days, and his enthusiasm is proof that the Forty Five is motor grader news worth looking into. Check and you'll find toggle-type controls are only one of many features that mean new performance and new operating ease.

The big Allis-Chalmers diesel

engine provides real lugging ability. The ROLL-AWAY moldboard rolls the load instead of pushing it . . . moves it faster with less effort. Fully enclosed power steering, new accelerator-decelerator pedal, real operator comfort, excellent visibility, all add up to the kind of production and long-life service you want.

See the Forty Five. Try the Forty Five. Find out for yourself the many advantages that will help you get top performance and big production on your jobs.

Your Allis-Chalmers dealer has complete facilities to serve you—factory-trained sales and service personnel, factory-approved service equipment and complete stocks of True Original Parts.

ROLL-AWAY is an Allis-Chalmers trademark.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

**FORTY FIVE**  
120 brake hp • 23,800 lb

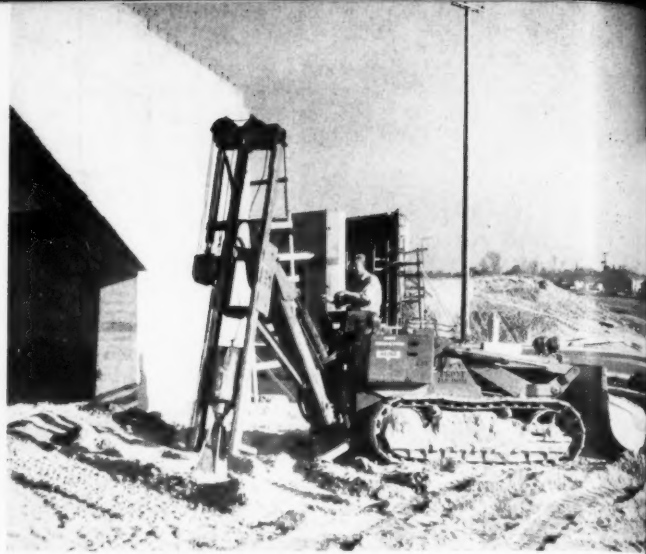
**ALLIS-CHALMERS**



For more facts, use Reader-Reply Card opposite page 18 and circle No. 369

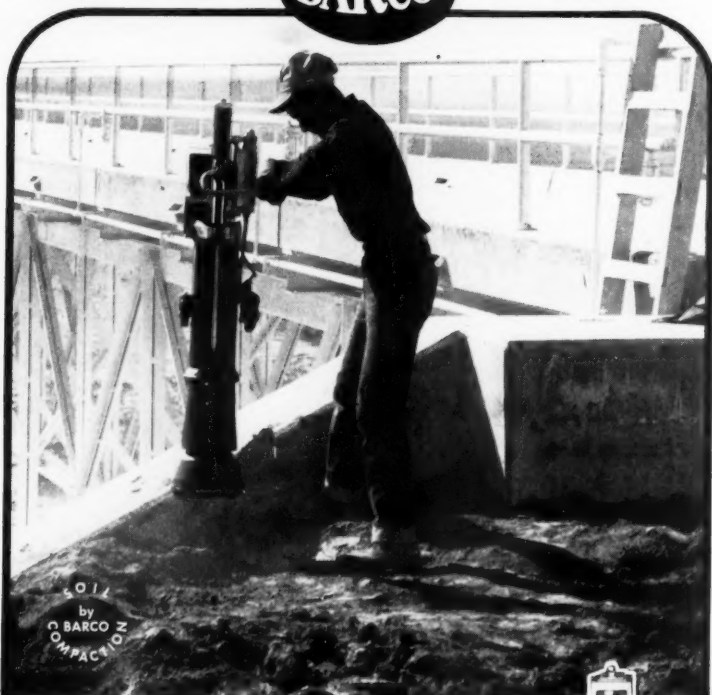


RIVER-RUN GRAVEL from Kicking Horse River in the Canadian Rockies is loaded into a Caterpillar DW21 tractor and scraper unit as another rig moves into position for a load. About 600,000 cubic yards of gravel is being used for the sub-grade of the Trans-Canadian Highway, near Field, B. C.



WORKING WHERE SHEEPSFOOT rollers and other compactors cannot go, an International Drott TD-6 Skid-Shovel uses an Ottawa Steel tamper to compact base near an overpass structure on the Fresno Freeway, Calif. Gener Richards, Inc., Fresno, has the \$1,250,000 contract.

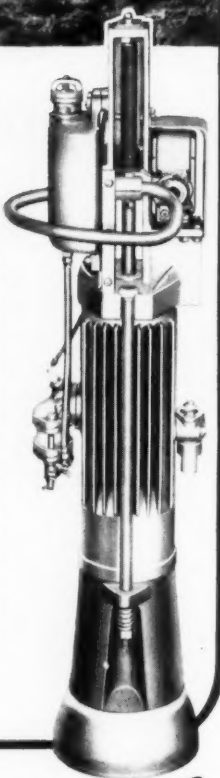
## GASOLINE BARCO RAMMER



### Barco Performance Pays Dividends!

**Job Finished on Time!**—When project specifications call for SOIL COMPACTION, Barco performance can't be beat! In test after test, Barco Rammers have demonstrated their ability to deliver 95% to 97.5% compaction (modified Proctor Method)—RAPIDLY! EFFICIENTLY! ECONOMICALLY! The Barco Rammer is especially effective for compacting fill in restricted areas—close to walls, culverts, abutments, around footings, and in trenches—on all kinds of construction jobs: Atomic Energy, Air Bases, Hydroelectric Power and Flood Control Dams, Highways, Toll Roads and Freeways, Bridges, Buildings, and Housing Developments. On area tamping, one man can average 20 to 30 cubic yards of fill per hour. On trench backfill, using lifts up to 24", the rate for 18" trench is 360 to 600 feet per hour.

**Ask for a Demonstration**—We will be glad to arrange a demonstration for you; see our nearest distributor or write. SEND FOR A COPY OF CATALOG 621.



**BARCO Manufacturing Co.**

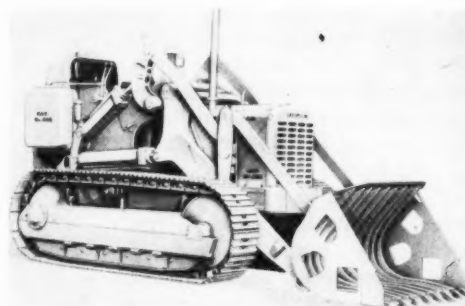
518K Hough Street

Barrington, Illinois

For more facts, use Reader-Reply Card opposite page 18 and circle No. 370

### Three new buckets for tractor loaders

The new Skeleton rock buckets for Caterpillar No. 977 and 955 Traxcavators are especially useful for handling shot rock and riprap.



Increased versatility and work capacity are claimed for the new buckets being offered by Caterpillar as attachments for the No. 977, No. 955, and No. 933 Traxcavators.

Designed to fill specialized needs in pit operations, rock handling, pavement removal, and other tough jobs, the new buckets include heavy-duty, quarry, and Skeleton rock models.

The new quarry buckets are available for all three models of Traxcavators. Constructed of heavy, abra-

sion-resistant steel and equipped with welded-on tooth adapters and removable tooth tips, these buckets range in capacity from 1 cubic yard for the No. 933 Traxcavator to 2 1/4 cubic yards for the No. 977.

The new Skeleton rock buckets are available for use with the No. 955 and No. 977 Traxcavators. Designed to retain large rocks while letting dirt and small rocks sift out, the new units are recommended for the handling of shot rock and riprap. Capacity of the

GET 59% MORE LIGHT OUTPUT...

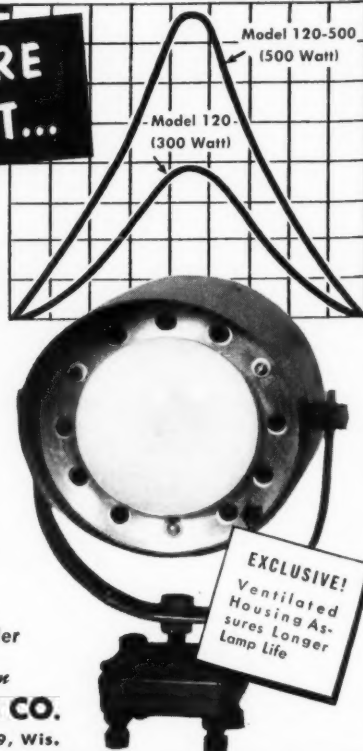
From Model 120  
500 Watt

### STURDILITE FLOOD LAMP

- Steps up night-time production —
- Adds to SAFETY! ...
- Especially Adapted for Operations Such as Open Pit Mining, Stripping, Dredging, Excavating, Crushing and Mix Plants, Logging, Road Building, Drilling, Quarrying, Etc.

WRITE For Illustrated Folder

Metal Spinning Division  
**PHOENIX PRODUCTS CO.**  
4727 N. 27th St. • Milwaukee 9, Wis.



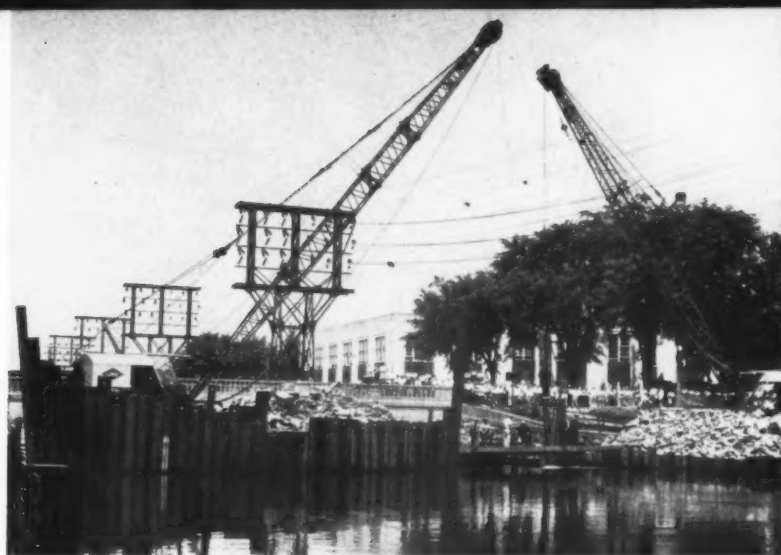
EXCLUSIVE!  
Ventilated  
Housing Assures Longer  
Lamp Life

For more facts, use Reader-Reply Card opposite page 18 and circle No. 371

CONTRACTORS AND ENGINEERS



THE LAST OF THE FLOOR TRUSSES for the new Walt Whitman suspension bridge between Philadelphia, Pa., and Gloucester, N. J., is lifted into place by two 16-ton travelers. Bethlehem Steel Co., Bethlehem, Pa., is doing this work on the \$90 million span, which will be open for traffic next year.



CANAL WATERS that powered the big Niagara Mohawk Schoellkopf station—two-thirds of which collapsed when 50,000 tons of rock gave way and fell into the Niagara River gorge—are dammed with Bethlehem Steel sheet piling. Lima cranes handle the piling and place the rock behind the sheeting.

No. 955 Skeleton rock bucket is  $1\frac{1}{2}$  cubic yards, while the model designed for use with the No. 977 Traxcavator is rated at  $2\frac{1}{4}$  cubic yards. Both are equipped with welded-on tooth adaptors and removable tooth tips.

The new heavy-duty bucket for use with the No. 977 Traxcavator is similar in design to the one previously offered for the No. 955 Traxcavator. It

is  $77\frac{1}{2}$  inches wide. Rated at  $13\frac{1}{4}$ -cubic-yard capacity, this rigid, narrow bucket is said to be ideal for concentrated digging action in dense, hard-to-penetrate materials. It is also useful for loading narrow cars.

For further information write to the Caterpillar Tractor Co., Peoria 8, Ill., or use the Request Card at page 18. Circle No. 75.

#### Concrete, tiling work complete Lincoln Tunnel

With the approaches and entrances of the third tube of the Lincoln Tunnel virtually finished, contractors are busy completing the roadway and installing about 2,500,000 tiles that will line the new tunnel. The tube is built under the Hudson River between New York and New Jersey.

The exhaust duct at the top of the tunnel and the fresh air duct at the bottom, as well as the side walls, are being made into a continuous concrete substructure. A steel form is being jacked into place to form the roadway and the top of the fresh air duct. Side-wall construction comes

next; a machine with hydraulically controlled arms holding the curved forms in place while pours are made.

After the curved top of the tunnel has been poured, another form is used while concrete is poured for the flat slab forming the ceiling of the tube.

The roof tiles are being installed as the pour is made for the flat roof of the tube. The tiles are laid face down on the roof form, their faces protected by paper, and the concrete poured over them. Tiles on the side walls are being installed on the sides of the tunnel after the pour has been made.

## Prevent costly slips with low-cost FLINTDEK!

Slips come suddenly, unexpectedly. And when they occur you may lose the services of needed employees . . . suffer costly damage or breakage . . . increase your accident insurance rates! X marks the spots where Flintdek Anti-slip Coating should be a must.



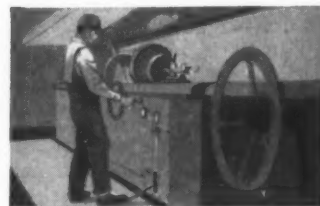
X . . . Use Flintdek around machinery, on pedals, steps and ladder treads . . . on ramps, platforms, floors and decks. In locker rooms, lavatories, showers. It's your sure protection against slipping.



X . . . Be sure to use Flintdek\* on steel, concrete, wood and other uncoated surfaces made dangerous by oil, grease, wear, weather. It dries quickly, bonds permanently.



X . . . Flintdek is resistant to fire, water, oil, gasoline, dilute acids, alcohol, fats and greases. Properly applied, it won't chip, crack or peel. And it's *easy* to apply . . . you simply trowel it on!



X . . . Flintdek offers you safety you can count on. It is classified and listed as an anti-slip flooring surface by Underwriters' Laboratories, Inc. And its COST is low . . . covers approx. 50 sq. ft. per gallon.

\*Reg. U. S. Pat. Off.



## FLINTKOTE Products for Industry

THE FLINTKOTE COMPANY, INDUSTRIAL PRODUCTS DIVISION  
30 Rockefeller Plaza, New York 20, N. Y.

BOSTON • CHICAGO HEIGHTS • DETROIT • LOS ANGELES • NEW ORLEANS • PHILADELPHIA

In Toronto, Ontario: THE FLINTKOTE COMPANY OF CANADA, LTD.  
In London, England: Industrial Asphalts Company, Ltd.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 373



## ROLATAPE MEASURING WHEELS

FOR EFFICIENT, TIME-SAVING ECONOMICAL MEASURING!

Actual working conditions prove that measuring time can be cut to a fraction with a Rolatape Measuring Wheel.

**ROLATAPE MODEL #400**—Widely used by Telephone Companies, Utilities, Paving Contractors, Land Appraisers, etc. It's four-foot circumference measuring wheel gives accurate measurements even on fairly rough terrain. Constant logging information in plain view . . . Can be operated from car at slow speed. . . . Light weight and sturdy . . . calibrated wheel measures from zero up to nearly nineteen miles. . . . Counter can be reset at any distance.

**ROLATAPE MODEL #200**—For interior and outside use. Widely used by Real Estate Men, Appraisers, Roofers, Traffic Officers, etc. A built-in totalizer records measured distance in feet and inches. Measures line-to-line and wall-to-wall. . . . Vertical measurements are easy to make . . . simple to operate. Extend handle, guide . . . Rolatape measures and records.

**ROLATAPE MODEL #600**—For cross-country and acreage measurements, or measuring conduit distances where rough terrain ordinarily creates traction problems. Can be mounted from rear of jeep, tractor, or any slow moving vehicle. Special hitch available. Measures up to nearly nineteen miles. Records as it measures.

FOR ROLATAPE INFORMATION, SEE YOUR DEALER, DISTRIBUTOR OR WRITE TO

## ROLATAPE INC.

FACTORY: 1741 FOURTEENTH STREET, SANTA MONICA, CALIF.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 372



TWO DIFFERENT TYPES of operations keep work moving on the new Kansas Turnpike. Above, clay and shale fill, spread in 8-inch lifts, is compacted by a Hyster Model GC grid roller. C. F. Lytle Co., Sioux City, Iowa, contractor on this stretch, uses a Cat DW15 tractor to pull the compactor. At another section of the pike, a



Manitowoc Model 3250 rock shovel, above, handles 4,000 tons of crushed rock daily with a 2½-yard bucket as material is turned out for an 8-mile section. The LeTourneau-Westinghouse Tournarocker is loaded with 22 tons of rock in 1¼ minutes.

# Haul, Dump and Spread

Any Material  
You Can  
Top Load

USE

**C & D  
Movall**

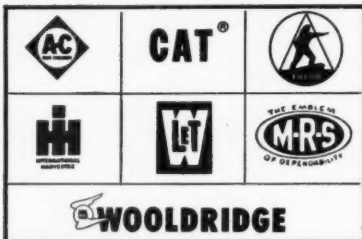


Movall's scraper-in-reverse design pushes load straight back. There's no danger of tipping. It's the only wagon that does work of both an end-dump and a bottom-dump.

This rugged wagon uses a unique dozer-type ejector that positively pushes out all materials, from sticky clay to shot rock, cleanly and quickly (25-yd. loads in 12-14 seconds). Movall dumps behind wheels so you can spread load like a scraper, with depth controlled (3 to 18") by tractor speed...or dump on grade, over edge of fill, and into hoppers at controlled rate; also unload while turning at end of road fill.

Built to take shock loads of 6-yd. buckets. Massive box-beam construction of high alloy steels prevents body spread, or damage to top rails.

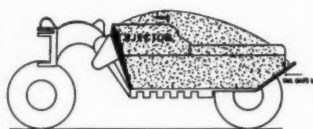
Available for all makes of rubber-tired tractors. Movalls are made in sizes from 12 to 26½ cu. yds., struck; 22 to 45 tons rated load, for:



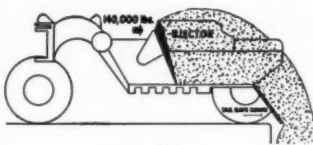
Allis-Chalmers TS300 and TS360  
Caterpillar DW20, DW21, DW15, DW10  
Euclid TDT, FDT, LDT  
International 75 and 55  
LeTourneau Super C  
M-R-S—all models  
Wooldridge—all models

Why tie up money in single-purpose units when you can get Movalls to use with any available rubber-tired tractor that hauls your scrapers? Buy Movalls where you buy your tractor...ask the dealer for a demonstration on our buy-and-try plan, or write C & D Division, Yuba Manufacturing Co., 701 East H Street, Benicia, California. Phone 628.

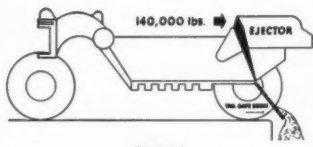
## How It Works



LOADED



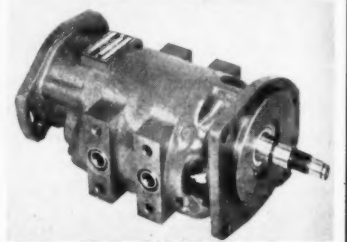
DUMPING



EMPTY

## Hydraulic steer control for large crawler units

■ A special Hydresco Series 1500 dual-gear-type hydraulic pump has been announced by the Kalamazoo Division of The New York Air Brake Co.



This Hydresco dual-gear-type hydraulic pump mounts directly on the transmission and powers the steering control for tracks on large crawler units.

The new pump, which operates at pressures up to 1,500 psi at 2,000 rpm, is designed to power-steering control on both right and left-hand tracks of

## FOUNDATION CONSTRUCTION

## CAISSONS SHAFTS DRILLED AND UNDERREAMED PIERS

## SPECIAL DRILLING PROBLEMS

OFFICES IN ATLANTA, GA.  
AND PITTSBURGH, PA.

Wire or phone for a quotation  
on your next foundation job —  
ANYWHERE IN THE WORLD

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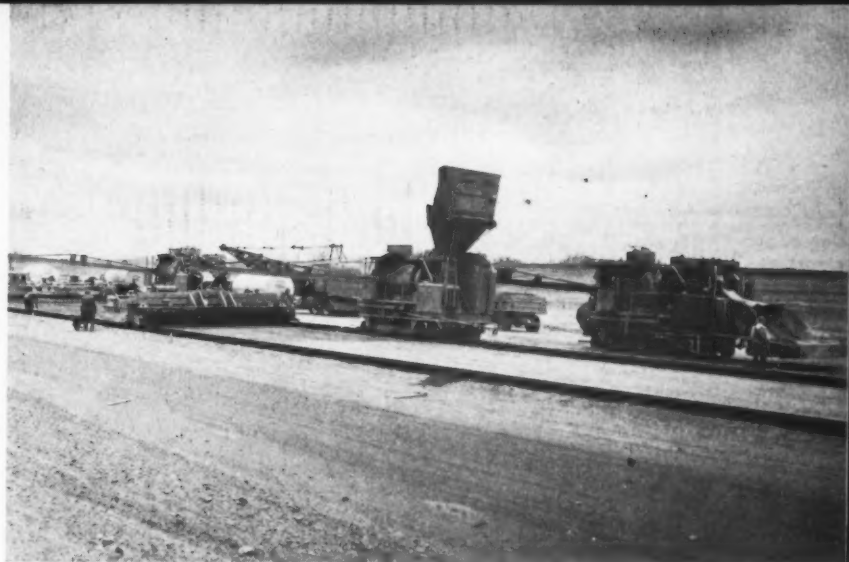
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NEERS



**GRADING AND PAVING**, the bulk of work done on the Kansas Turnpike this summer, took a huge amount of diversified and versatile equipment. One of the most useful rigs for S. J. Groves & Sons Co., Minneapolis, Minn., was the Cat D4 tractor with dozer, above, which uses an Ottawa backhoe for digging on a rock



cut near Matfield Green. At the east end of the pike, J. A. Tobin Construction Co., Kansas City, Kansas, has three Koehring Twinbatch pavers at work as the 10-inch concrete slab is placed in 7 and 3-inch lifts. Blaw-Knox and Jaeger spreaders strike off the concrete.

large crawler equipment. It has a through shaft to provide drive for magnetos and other auxiliary components.

Pressure-balanced wear plates keep volumetric efficiency high at all pressures. Balanced hydraulic forces of both sides of the plates maintain fixed clearances between plates and gear faces so oil slippage is reduced to a fixed minimum and friction contacts are eliminated, according to the manufacturer.

The particular unit illustrated here is designed for direct mounting on transmissions, but many modifications of this special pump assembly are available.

For further information write to Kalamazoo Division, The New York Air Brake Co., P. O. Box 1609, Kalamazoo, Mich., or use the Request Card at page 18. Circle No. 117.

Sales of ready-mix concrete totaled \$1 billion during 1954, according to the Census of Business conducted by the U. S. Bureau of the Census.

## NOW . . . step up dragline output ... WITH ALL-NEW BUCYRUS-ERIE BUCKETS



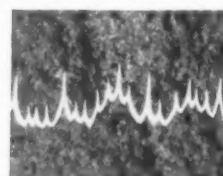
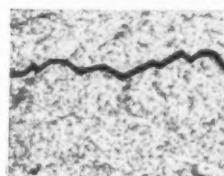
You swing more payload, less deadweight every hour with the new Bucyrus-Erie dragline buckets. A combination of an all-new, lightweight yet strong design and a new long-wearing material makes it possible.

The new material is BECOLOY, a special steel alloy with a tough, fibrous structure ideally suited to dragline bucket service. The new design features a "slicing-action" lip that penetrates material quickly, and a tapered basket shaped to load full and fast. Proper flaring and balance minimize spilling and bobbing. The inside design is smooth and the arch is extra high for fast, clean dumping.

Your Bucyrus-Erie distributor can help you select the right size and model of these new buckets to fit your job, to bring you better out-

put performance than ever before. Three types are available—light, medium and heavy-duty—with either solid or perforated baskets.

**BECOLOY** . . . exclusive new alloy for Bucyrus-Erie dragline buckets.



The BECOLOY fracture surface at right shows the tough, fibrous structure that imparts high strength to this alloy. Ordinary steel fracture surface, at left, has a coarse, crystalline pattern.

19R56

**BUCYRUS  
ERIE**

SOUTH MILWAUKEE, WISCONSIN

For more facts, use Reader-Reply Card opposite page 18 and circle No. 377

## INDIAN DRINKING WATER & SUPPLY TANK NO. 75G



Replaces unsanitary bucket and dipper. Portable. Push button faucet. Takes cold, clean water to workers right on the job. 5-gallon steel tank is curved to fit the back. Sturdy construction. Highly popular. Send for circular.

### SMITH

Compressed Air  
No. 22GO BANNER  
SPRAYER  
Capacity 4 Gals.

For spraying Silicon water repellents for masonry work and many other spraying purposes. Finest compressed air sprayer built. Send for catalog. Discounts in Quantity Lots.

**D. B. SMITH & COMPANY**  
"Choice for Quality the World Over"  
470 Main St., Utica 2, New York

For more facts, circle No. 376

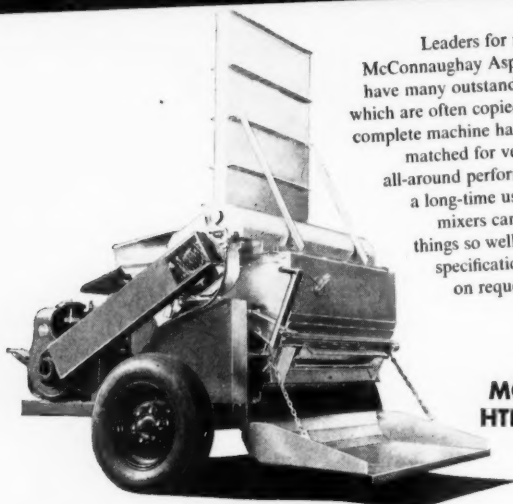


**STOCKPILED AGGREGATES** at the Irwindale, Calif., plant of Consolidated Rock Products Co., Los Angeles, Calif., are loaded out to a waiting truck by the firm's Insley WB self-propelled rubber-tire crane. The rig, using a clamshell bucket, also helps to maintain the stockpiles.



**GRANITE BOULDERS**, part of 850,000 cubic yards of material needed to fill a peat bog on the Boston-Southeast Expressway, are loaded into a Euclid rear-dump by a Bucyrus-Erie 51-B shovel. The 2-yard rig is working for Marinucci Bros & Co., Boston, on a section near East Milton, Mass.

## Often Copied but Never Matched

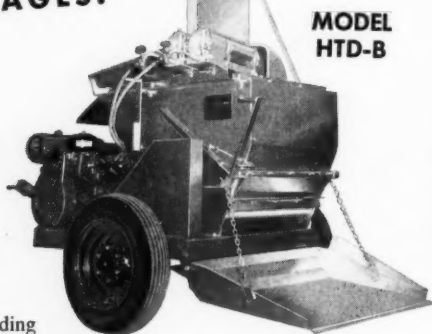


Leaders for many years, McConnaughay Asphalt Mixers have many outstanding features which are often copied... "but the complete machine has never been matched for versatility and all-around performance," said a long-time user. No other mixers can do so many things so well. Details and specifications (available on request) will show you why.

**MODEL HTD-500**

## McConnaughay MULTI-PUG ASPHALT MIXERS

**OFFER MORE  
ADVANTAGES!**



**MODEL HTD-B**

McConnaughay Mixers are the result of more than 25 years' active experience in building mixing equipment and in all phases of the paving industry. Extensive laboratory and field testing assure buyers that these mixers will do the job in practice as well as in theory. Hundreds of the two mixers illustrated are in active service in 46 States, Alaska, Canada, South America, Europe and Africa. Designed for fast, economical operation in any climate in any season... they do the job wherever located. That's why customers are our best salesmen. Write for name of user nearest you.

**K. E. MCCONNAUGHAY** National distributors: Asphalt Equipment Co., Inc., 3929 Buell Drive, Fort Wayne, Indiana  
**LAFAYETTE, INDIANA**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 378

## Portable temporary traffic control kit



The Lyle Saf-T-Pak is a compact traffic-control kit which unfolds to a 46½-inch height.

■ The Lyle Saf-T-Pak, a portable emergency traffic-control kit, has been announced by the Lyle Sign Co. This new unit is unfolded and set up in less than a minute, thus providing a temporary road builder's aid where added traffic control is needed.

Reflective sheeting on the sign panels and signal flags provides high visibility day or night.

The sign kit opens like a suitcase; the two sides fold down and are locked tightly in place by triangular metal plates that are also utilized to keep the unit locked when not in use. It unfolds to 46½ inches in height, and flags swing out from stored position in the rear of the middle sign panel. Blinker lights are inserted in slots on the rear of the middle panel and are locked rigidly in place. Six signs with messages on both sides are included with each unit.

The Saf-T-Pak is constructed of bonderized 20-gage steel and has a durable enamel finish. Dimensions of the folded kit are 20¾ x 16¼ x 5 inches.

For further information write to the Lyle Sign Co., 2722 University Ave. S. E., Minneapolis 14, Minn., or use the Request Card at page 18. Circle No. 94.



## with this WISCONSIN-POWERED Carley Auto Dump Trailer

Typical of the versatility of Wisconsin-Powered construction equipment is this Carley Auto Dump Trailer, made by Carley Trailer & Equipment Co., Atlanta, Ga. Shown in the illustration is one of these units dumping 20 tons of granite into a spreader.

According to the manufacturer, ONE driver does the work of three; ONE TRUCK hauls three times as much as it can "carry on its back." A Wisconsin Heavy-Duty Air-Cooled 4-cylinder Power Unit supplies the always-ready, dependable power that operates the hydraulic lift... no power take-off, no universal joints, no drive shafts. Wisconsin basic High Torque design and heavy-duty construction provide the inbuilt Lugging Power and Stamina that handle the job at lowest operating and maintenance costs.

You can't do better than to specify "Wisconsin Power" for your equipment — Backed by over 2,200 Authorized Wisconsin Service Stations in the U. S. and Canada. Write for Bulletin S-188.



**WISCONSIN MOTOR CORPORATION**  
World's Largest Builders of Heavy-Duty Air-Cooled Engines  
MILWAUKEE 46, WISCONSIN

For more facts, use Reader-Reply Card opposite page 18 and circle No. 379

CONTRACTORS AND ENGINEERS

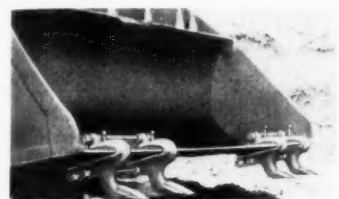


TEAMING UP TO LIFT a 42-ton precast reinforced-concrete girder, two Lorain 30-ton cranes bring construction of a 25,000 square-foot facility for Calaveras Cement Co. to completion at San Andreas, Calif. The \$4 million expansion program will give the firm added office, laboratory, and shop space.



A VIRTUALLY ISOLATED crew works on one of sixty bridges for the "Atlantic Railroad", a 468-mile line linking the Pacific and Caribbean ports in Colombia. The \$80 million project, eliminating coast-to-coast shipments via the Panama Canal, is being supervised by Madigan-Hyland South American Corp., New York City.

### New ripper facilitates bucket-loader work



A new-type ripper designed especially for speeding up bucket-loader operations has been developed by Hensley Equipment Co.

Cast of special-alloy moly-manganese steel, the new bucket-loader ripper clamps directly to the lower lip of any standard bucket loader, enabling the rig operator to rip and loosen dirt for easier, faster loading. It is said to be an ideal tool for facilitating corner cuts, for excavating small footings, and for many other loader operations.

The new Hensley ripper unit consists of two ripper teeth rigidly mounted 12 inches apart by three 1 1/4-inch heat-treated steel spacer

bolts. The teeth are equipped with replaceable, self-sharpening wear-points, and are angled downward to provide an 8-inch penetration when the bottom of the bucket is parallel to the ground.

Because of their light weight, the Hensley bucket loader rippers are easily handled by one man, and may be completely installed or removed within 60 seconds. From one to four units are used for full coverage, depending on the type of work in progress.

For further information write to Hensley Equipment Co., Inc., 800 Peralta Ave., San Leandro, Calif., or use the Request Card at page 18. Circle No. 89.

A 3-day conference for operators of diesel and gasoline power plants will be held October 15-17, by the Division of Engineering and Industrial Extension, Oklahoma A & M College, Stillwater, Okla.

PICTURE OF A CONTRACTOR...

# MAKING MONEY!

with a **ROSCO**

That's a photo of Francis Willette of the Willette Excavating Co. blacktopping the 8300 sq. yd. parking lot of the Dunwoody Institute in Minneapolis. His Rosco MODEL RHU MAINTENANCE DISTRIBUTOR is making money on every job. Quick to start and get going, the RHU is designed for economical bituminous maintenance and limited construction. It has many of the features required by contractors . . . as well as municipalities. For driveways, alleys, streets, parking lots, shoulders, re-shaping curves, patching, sealing and a host of other jobs . . . Model

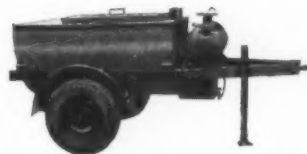
RHU will get YOU "into the profit picture". Check the money-making features with your Rosco dealer. He'll show you what Model RHU can do for you. 800 to 1000 gallon capacity.



2-Wheel Model RMT Maintenance Unit with front mounted heaters and rear mounted pump and engine is available in 400, 500 or 600 gallon sizes.

### ROSCO ASPHALT KETTLES

Used by contractors, highway departments, roofers and water-proofer for heating and melting all types of bituminous materials. Two-pass heating system, ruggedly built. Capacity 2, 3 or 4 barrels.



**Rosco**  
MINNEAPOLIS

3118 SNELLING AVENUE • MINNEAPOLIS 6, MINNESOTA  
DISTRIBUTORS • MAINTAINERS • BROOMS  
SUPPLY TANKS • TAR KETTLES • STREET FLUSHERS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 381

## HEAVY-DUTY BEAUTY

8 SIZES:  
3-5-6-7 1/2  
8-10-12-15  
TONS CAPACITY

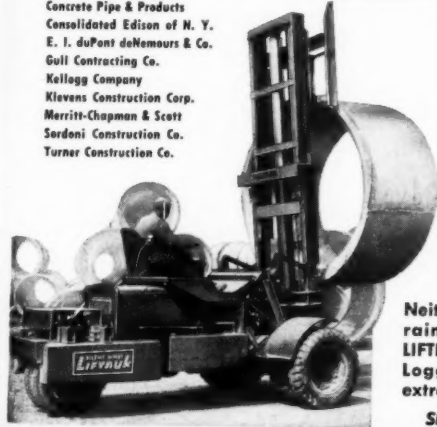
## SILENT HOIST LIFTRUK

This Fork Lift Truck is no "prima donna," but it is a heavy-duty beauty with smooth-as-silk performance.

- Extra-large Construction Tires for Traction.
- Generous Underside Clearance, chassis to ground.
- Giant Differential Traction Gear.
- Rugged Chassis and Tiering Frames.
- Fluid Drive in combination with 265 cu. in. engine.
- Power Steering.

Neither mud nor rough, rocky terrain will hang up SILENT HOIST LIFTRUK on Construction Sites . . . in Logging, Lumbering, and other extra-tough applications.

SEND FOR BULLETIN No. 77



### SILENT HOIST & CRANE CO.

Pioneer Mfrs. of Heavy Duty Materials-Handling Equipment  
898 A 63rd Street, Brooklyn 20, N. Y.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 380

**Faster, Safer, More Economical  
and LOOK No Wire Waste!**



**You save time**—when you change from outmoded wire-tying methods to IDEAL reel. Get 6 to 8 more ties per minute than with clumsy, over-the-head wire coils. No chance for time-consuming tangles, bent or kinked wire. *Saves wire . . . and money, too.*

# IDEAL<sup>®</sup>

## Tie Wire Reel Puts wire waste to work!

Yes—IDEAL reel stops costly wire waste. *Actually puts it to work.* Gives 33% more usage per pound of wire, on average. Increases tying speed 25% . . . often much more. Safeguards workers. Discover for yourself how IDEAL reel can speed your tying jobs . . . safely . . . and cut job costs, quickly and economically.

**Write—Wire—Phone—Collect**  
For full details

**Ideal Reel Company, 328 Harahan, Paducah, Ky.**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 382

*Now*

## ERIE CLAMSHELL BUCKETS OFFER YOU 7 COMPLETE GROUPS

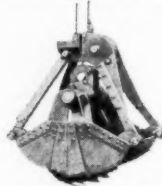
**WHATEVER  
YOUR  
REQUIREMENT  
THERE'S  
AN  
ERIE  
CLAMSHELL  
BUCKET  
ENGINEERED  
ESPECIALLY  
FOR  
THE  
JOB**



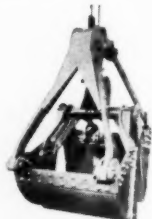
XLR, Extra Light Rehandler



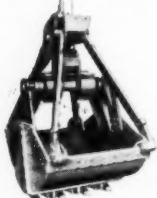
WR, Wide Rehandler



GP, General Purpose



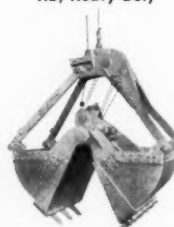
LR, Light Rehandler



HD, Heavy Duty



SR, Standard Rehandler



XHD, Extra Heavy Duty

**Of all the buckets made, only Erie gives you this combination of sound engineering features:**

1. Top closing power from block and tackle, plus lever arm construction, plus precision balancing.
2. Manganese steel teeth and high carbon steel lips that bite up full payloads of even toughest clay and gumbo.
3. Rigid, one-piece, welded head that shrugs off bumps, and jars. No shimmy. No wobble.
4. Two-line, continuous reeving. Adds up to 50% to cable life. Less down-time for reeving.
5. Low headroom for fast work in tight quarters; low center of gravity for easy positioning.

For catalogs, write Dept. CE-96

# ERIE STRAYER Co.

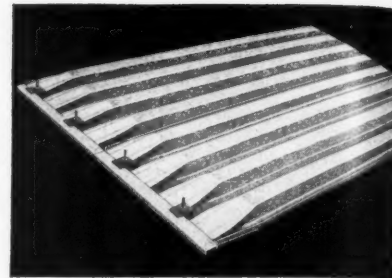
3296 GEIST ROAD • ERIE, PENNSYLVANIA

Makers of Extra Light, Light, Standard and Wide Rehandlers, General Purpose, Heavy Duty, Extra Heavy Duty, Electric and Mechanical Hook-On Clamshells.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 383

## Bridge deck forms are left in place

The United Steel Fabricators leave-in-place steel forms for concrete bridge flooring.



■ A leave-in-place steel form for concrete bridge flooring is offered by United Steel Fabricators, Inc. Recommended for high spans and those involving hazardous conditions, the forms are adaptable for almost all poured concrete floors.

Fabricated from trapezoidally corrugated, long-life, galvanized steel sheets in 2-foot laying widths, the forms are left in place, eliminating the necessity for wood form construction, shoring, safety nets, and stripping operations. Erection schedules are speeded up, fewer man-hours are

required, and there is no waste of valuable form lumber, the company states.

The forms are custom-made at the plant to fit the bridge structurals. They are shipped to the site ready for installation. In addition, finish coats of structural paint can be applied and other operations performed from top-side before the concrete flooring is laid.

For further information write to United Steel Fabricators, Inc., Gasche St., Wooster, Ohio, or use the Request Card at page 18. Circle No. 18.

## WRI distributes bulletin on wire reinforcement

A bulletin on the use of welded wire fabric reinforcement in asphaltic-concrete pavement overlays, prepared by the American Road Builders' Association, is now being distributed by the Wire Reinforcement Institute, Inc. The booklet, Technical Bulletin No. 215, contains two papers: "The Practical and Laboratory Use of Wire

Fabric in Bituminous Resurfacing at Willow Run Airport," by Floyd G. Wakefield, and "Resume of Results of Welded Wire Fabric in Bituminous Surfaces," by Norman G. Smith.

Copies may be obtained free of charge from the Wire Reinforcement Institute, Department 215, National Press Bldg., Washington 4, D. C.

## Literature on bituminous paving sealer

■ Black Knight surface sealer, developed by Maintenance Engineering Co., is a pitch emulsion insoluble in oils, gasoline, and jet fuels, according to literature from the company. The folder describes how the sealer, applied by a squeegee or brush over the

surface of bituminous concrete, fills in cracks, holes, and depressions.

To obtain the literature write to Maintenance Engineering Co., 16 W. Johnson St., Philadelphia 44, Pa., or use the Request Card at page 18. Circle No. 51.

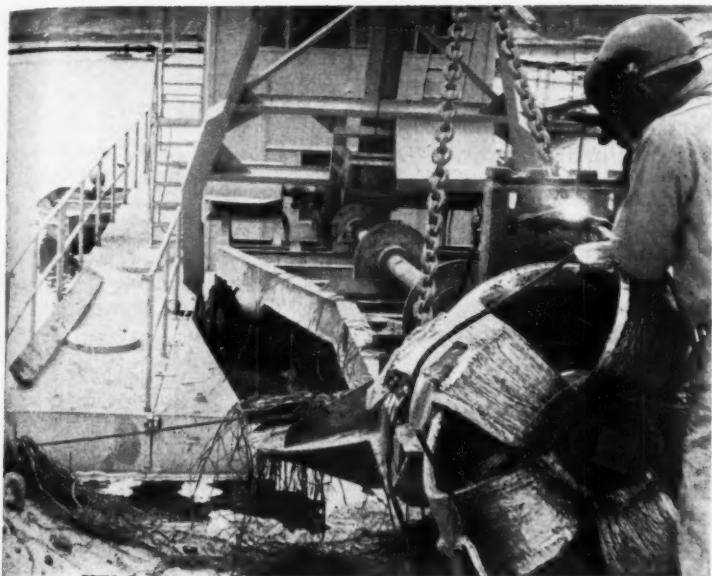
Buy MADESCO, and you benefit by over thirty years specialized experience in designing blocks for countless specialized needs. Available with heavy steel (or wood) shells, heavy fittings, plus iron or steel graphite bronze, self-lubricating sheaves, bronze or antifriction bearings. Madesco features sum up to safe, fast lifting, longer rope-life, trouble-free service. Consult your distributor for standard blocks for delivery from stock . . . and meantime write for our complete catalog. Special engineering services and recommendations also available.

MADESCO TACKLE BLOCK CO., Easton, Pa.

# MADESCO BLOCKS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 384

CONTRACTORS AND ENGINEERS



USING A 250-AMP HOBART GAS-DRIVE WELDER with 5/32 and 3/16-inch Tufan-hard 600 electrodes, and welding at 130 to 200 amps, a Southern contractor rebuilds the cutterhead on his sand sucker in 4 or 5 hours each week. The work is done by one of the regular employees who has had almost no previous welding experience, according to the Hobart firm. The hardfacing is applied primarily to the teeth of the cutterhead. They are made of manganese steel and are 3 inches wide, 8 inches long, and 2½ inches across at their thickest point, tapering to a knife-like edge. There are three teeth on each of the five blades that get the Saturday welding treatment. According to the manufacturer, it takes fewer hours to rebuild the cutterhead in the field than to replace it altogether. For more details write to the **Hobart Bros. Co.**, Hobart Square, Troy, Ohio, or use the Request Card at page 18. Circle No. 166.

#### Year-round use of one rig eases maintenance work

A 70 per cent saving on the cost of digging and shaping new irrigation canals and on the cost of maintenance work has been reported for the Warner & Swasey Gradall by the Merced Irrigation District at Merced, Calif. Used on 143,864 acres of irrigated land, the unit has been in steady use since December, 1953.

During the winter months, the Gradall has been used for excavating and shaping new lateral canals and for digging footings for the installation of drops, headings, and siphons. In the spring and summer, the unit is used

for clearing weeds, moss, and tules from the canals and ditches as well as for moving tons of silt from the channels.

A special form ditching bucket, measuring 17 feet across the top, enables the unit to excavate in hard compacted earth at an average rate of 450 linear feet per 8-hour day. Quick, safe removal of heavy, timber roof sections of a covered canal was done by the Gradall and a gripping tool. These enabled the operator to do this work easily, and eliminated all hand labor.

#### Bronze skyscraper walls weather hurricane tests

A two-story replica of the Seagram Building, the first bronze skyscraper, has withstood hurricane tests to determine its watertightness and the durability of window and curtain-wall construction. Staged on the grounds of General Bronze Corp., Garden City, N. Y., the hurricane consisted of winds up to 120 mph, generated by an airplane propeller, and a fall of water amounting to 4 inches per hour. Water pressure was applied from overhead and distribution rings behind the airplane engine. No damage was done to the interior of the building.

To be located at 375 Park Ave., New York, N. Y., the building will contain 530,000 square feet of office space.



VERTICAL PRESTRESSING OF CONCRETE walls for a concrete water tank is done with a Re-Mo-Trol hydraulic jack. Six wires, which are secured in the bottom of the wall, are prestressed at one time.

### Remote-Controlled Hydraulic Puller Perfected for Prestressing Concrete

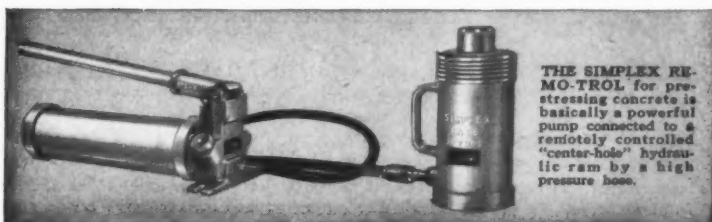
Construction Men Cite Simplex Unit for Fast, Easy Use

Tensioning cable, wires or rods for concrete prestressing is being done easily and quickly with Simplex hydraulic "center-hole" pullers, a number of construction men report. Because the unit is actually made up of two parts, a remotely controlled ram and a pump, the puller is more easily handled than conventional hydraulic jacks, they explain. The pump unit can be located nearby where it is most convenient for the operator. Many users install a pressure gauge, available as an accessory, between the pump and the puller to check the amount of prestressing applied. This Simplex Re-Mo-Trol puller is also useful on construction jobs as a powerful jack for lifting equipment and building sections, for aligning heavy beams, etc., and for testing the load bearing ability of the soil. Available in 7 models with

capacities from 10 to 100 tons, it works in tight spots and enables workmen to stay at a safe distance while lifting, pulling or pushing.

Made by the world's largest manufacturer of industrial jacks, the Re-Mo-Trol is only one of many Simplex jacks that are useful in the construction industry. Others include the famous Jenny self-contained "center-hole" puller, the No. 310A Emergency Jack which lifts 15 tons on the cap, on the toe, on a cap shoe or at intermediate heights with a chain sling, and standard hydraulic, screw and ratchet lowering jacks. They are all described in General Catalog No. 56. Write for a free copy.

TEMPLETON, KENLY & CO.  
2511 Gardner Road • Broadview, Illinois



THE SIMPLEX RE-MO-TROL for prestressing concrete is basically a powerful pump connected to a remotely controlled "center-hole" hydraulic ram by a high pressure hose.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 386



MILLER "B" 6 ton  
\$895.00\* F.O.B. Milwaukee  
Any optional equipment extra  
\*Plus Freight and 8% Federal Tax

Whatever you haul . . . dozers, rollers, trenchers, front-end loaders or backhoes, you'll load them faster . . . slash between-job-hauling time with a MILLER Tilt-Top! ONE man can tilt, simply drive the equipment onto the broad, oak decked platform, be on his way in less than two minutes! Available in a variety of single or tandem-axle models, there's a MILLER Tilt-Top to match your equipment needs. See these time saving, production boosters at your MILLER distributor today—you'll be surprised at how ruggedly they're built—how little they cost!

✓ built best  
✓ priced best

See your MILLER distributor or write for FREE literature to:

**Miller**  
**Tilt-Top Trailer Co.**

456 S. 92nd St., Milwaukee 14, Wis.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 385

## distributor doings

### Garlinghouse, Fremont open new headquarters

Continuous demonstrations of new construction machinery made for an appropriate gala opening about six weeks ago of the new sales headquarters and service center of Garlinghouse, Fremont & Co., Los Angeles. Demonstrations continued from 8 a.m. to 9 p.m. during the two-day open-house program at 6046 E. Washington Blvd.

Garlinghouse, Fremont — successor

to the retail division of Garlinghouse Bros. of Los Angeles—will distribute nearly 20 lines of construction machinery from the new facilities. The headquarters, built on a 1½-acre site, includes offices, parts department, service shop, indoor and outdoor display areas, and a large parking area.

A. F. Garlinghouse is chairman of the board, Ralph W. Whitaker is vice president, and Jack Monson is secretary-treasurer.

### New firm to handle Stoody sales in Midwest

The Stoody Co., Whittier, Calif., manufacturer of hard-facing alloys, has appointed Hardfacing Sales & Engineering Co., Chicago, Ill., as its new distributor in northern Illinois, southeastern Wisconsin, and north-

western Indiana. A newly organized firm, Hardfacing is headed by Jim Kirk.

### W. H. Anderson to handle line of warning lights

A new department devoted to the rental of Neo-Flasher warning lights, barricades, and auxiliary equipment has been organized by W. H. Anderson Co., Inc., Detroit, Mich. Made by the Neo-Flasher Mfg. Co., Burbank, Calif., the warning lights are used on highway or similar construction projects where automobile and pedestrian traffic must be informed of potential danger.

The new Anderson service will provide all the necessary Neo-Flasher equipment to guarantee the security of passers-by at construction projects.



Gerald W. Moore,  
South-Central territory  
representative



Bob Riley, advertising  
manager of H. W.  
Moore Equipment Co.

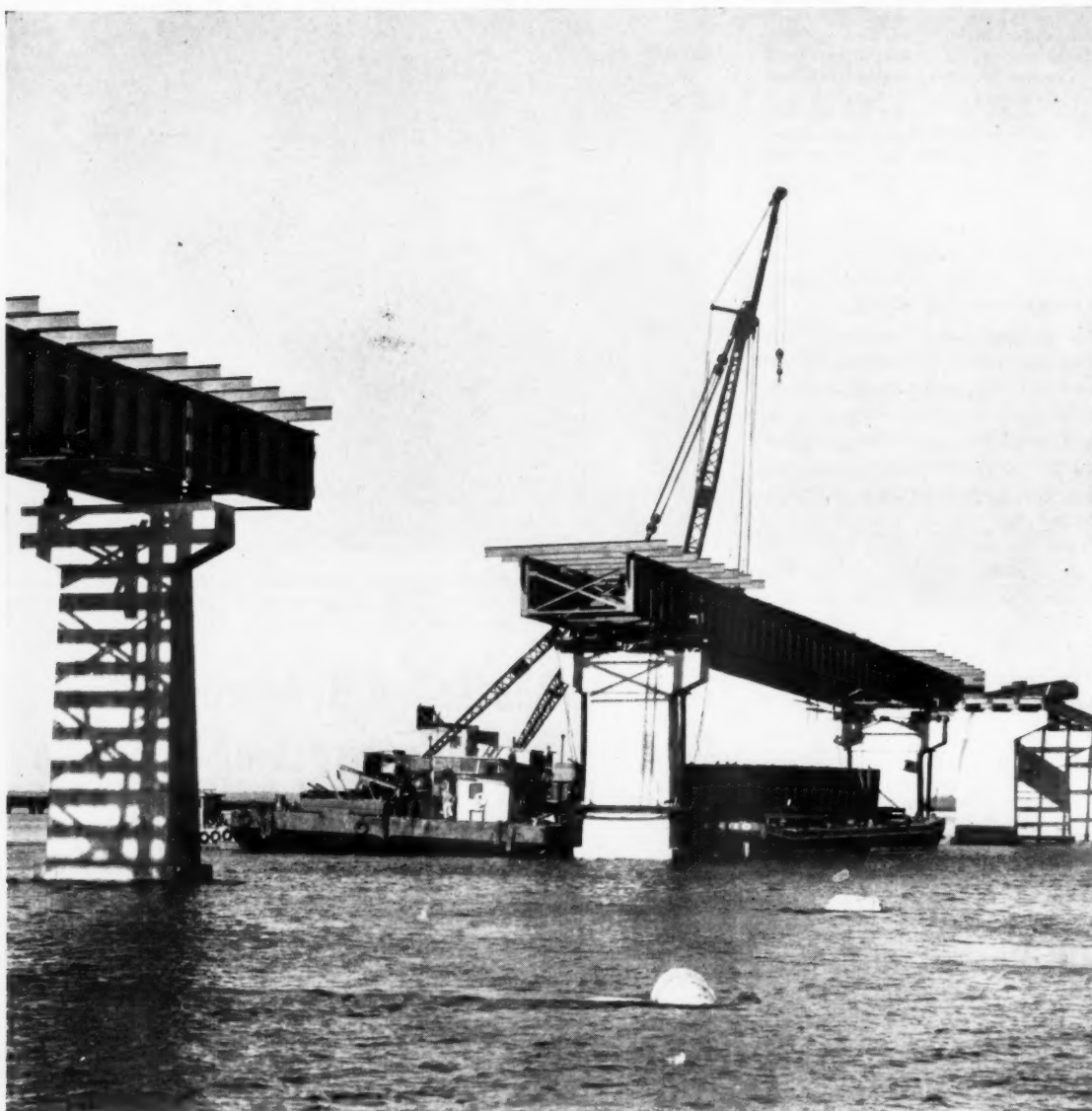
### Moore Equipment expands

In addition to its main office in Denver, Colo., and a branch in Grand Junction, the H. W. Moore Equipment Co., now operates another branch office in Durango. Under the direction of Glenn Schroeder, the new branch will serve the southwestern part of the state.

Gerald W. Moore has been named to replace Ralph Bickers as the firm's representative in the South-Central territory. Moore's former position as advertising manager has been assumed by Bob Riley. A new salesman for eastern Colorado, Bill Hardesty, has joined the firm and will work with Bickers, who is now assistant sales manager.

### Clark names four dealers

The Clark Equipment Co., Benton Harbor, Mich., has appointed four



**Wire Rope at Work**—New Jersey's great Garden State Parkway has the incredible total of 282 bridges, and the photograph above shows the last of them nearing completion. It is the Great Egg Harbor Bay Bridge, an impressive span just west of Ocean City. The steelwork, more than a half-mile long, weighs some 2500 tons.

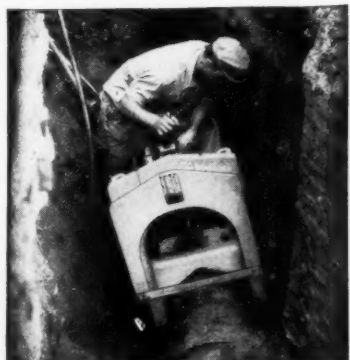
The picture was taken just after two 63-ton girders, completing a 180-ft span, had been erected. The derrick that did the hoisting was equipped with a 90-ft boom, a 43-ft mast, and Bethlehem Purple Strand wire rope. As always in lifts of this nature, a great responsibility rested upon the rope, but the sinewy Purple Strand was more than equal to the job. Taking the loads in stride, it made the dramatic lifts seem routine.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

Mid depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:  
CONSTRUCTION • EXCAVATING • MINING • QUARRYING • PETROLEUM • LOGGING • MANUFACTURING



For more facts, use Reader-Reply Card opposite page 18 and circle No. 387



### BIG GUILLOTINE THE NEW WACHS POWER PIPE SAW

No Flame—Safe Cuts Under  
Hazardous Conditions!

**FASTER — SAFER — ACCURATE!**

Cuts 10", 12", 14" & 16"

Cast Iron and Steel Pipe

**WACHS BIG GUILLOTINE SAW FACTS—**

- Cuts Fast
- Cuts Clean
- Cuts Square
- Set up time, several minutes
- Power—electric or air motor
- Weight 312 pounds
- Height 31"
- Width 31½"
- Depth 14½"

Power Pipe Cutters from 2 inch to 6 Foot Capacity

For further information write to:

**THE E. H. WACHS COMPANY**

1925 N. Dayton Street • Chicago 22, Illinois

For more facts, circle No. 388

CONTRACTORS AND ENGINEERS

new dealers to sell and service the Michigan line of cranes and tractor shovels. In California, Buran Equipment Co. of 777 100th Ave., Oakland, will cover 42 counties. A Nevada dealer, Sierra Machinery Co., Inc., 307 Morrill Ave., Reno, will handle 8 counties in California.

The N. C. Ribble Co., 1304 Fourth St., Albuquerque, N. Mex., will cover a territory north of and including Catron, Sierra, Socorro, Lincoln, Chaves, and Roosevelt counties.

Twelve counties in Iowa will be serviced by Anderson Equipment Co., Inc., 306 Virginia St., Sioux City.

### Three distributors add Koehring lines

Three new dealers have been appointed to handle equipment made by the Koehring Co., Milwaukee, Wis., and its subsidiaries, the Kwik-Mix Co., Port Washington, Wis., and the Parsons Co., Newton, Iowa.

The line of Dandie plaster-mortar mixers made by the Kwik-Mix firm has been taken on by John S. McBryde Co., Inc., Washington, D. C., on a non-exclusive basis. The Koehring and Parsons construction machinery, made by the parent firm and the Parsons Co., will be handled in northern New Jersey by the Jaeger-Lembo Machine Corp., Springfield.

In Canada, Koehring has also appointed Western Tractor & Equipment Co., Ltd., Regina, Saskatchewan, Canada, as its exclusive distributor in the area. Complete sales and service facilities on power cranes, shovels, concrete pavers, and finishers are offered at the firm's main office at 1540 Tenth Ave., Regina, and at a branch office at 625 First Ave. N., Saskatoon.

Western succeeds the W. F. Fuller Machinery Co., Ltd., as the Koehring distributor in the area.

### Littleford appoints

Three new dealers for the line of road-maintenance equipment have been named by Littleford Bros., Inc., Cincinnati, Ohio. The Roy Klossner Co., San Antonio, Texas; the Farley Equipment Co., River Grove, Chicago, Ill.; and A. Pickard Machinery Ltd., Charlottetown, Prince Edward Island, Canada, will offer sales and service on the line.

### Tips on extending life of wire rope

The Wickwire Spencer Steel Division of The Colorado Fuel & Iron Corp., Denver, Colo., has suggested two means of extending the working life of wire rope. The firm recommends that the rope be shifted periodically to distribute wear and that the position of the rope on the drum be reversed. In this way, Wickwire engineers say, it will not be necessary to replace rope used for hoisting when portions of it are still serviceable.

Reversing the rope, however, will not lengthen the life of the wire rope if the greatest wear is concentrated at the midpoint.

### Off-highway haulers

■ International Harvester's Payhaulers, Models 65 and 95, are described in new literature. Both the Model 65, 18-ton-capacity unit, and the Model 95, 24-ton-capacity unit, feature turbocharged diesel engines, and the all-welded I-beam frame is common to both rear-dump trucks. Complete specifications are given on the component parts of each Payhauler.

To obtain the literature write to International Harvester Co., 180 N.

Michigan Ave., Chicago 1, Ill., or use the Request Card at page 18. Circle No. 46.

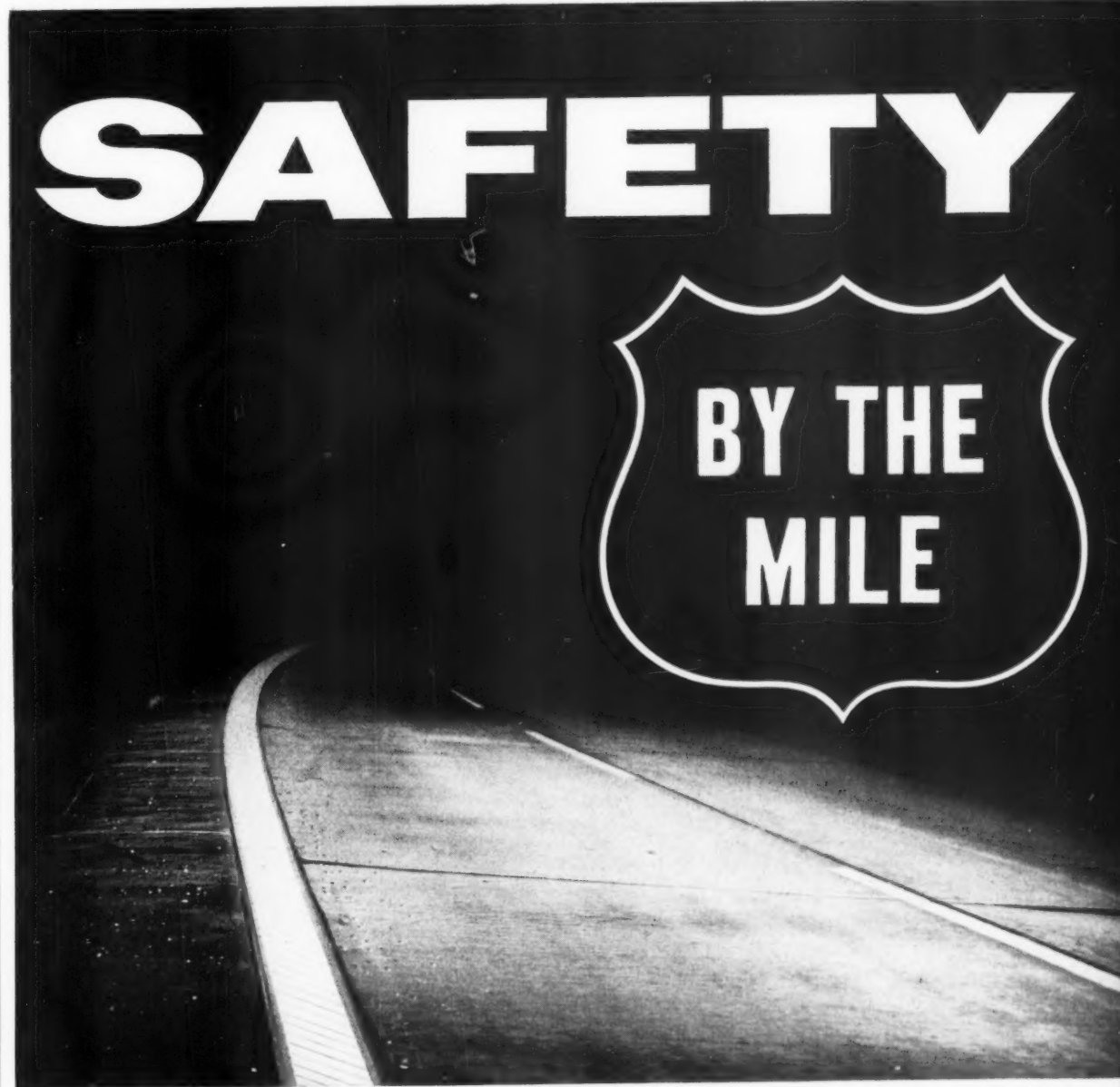
### Material-handling crane

■ The Hyster Model KE Karry Crane has a single-line capacity of 6,000 pounds and a 10,000-pound capacity on a 2-part line, according to literature from the Hyster Co. Pictured and described are the construction and design of the unit. The specifications chart states that the maximum speed,

forward or reverse, is 13.1 mph. Job photos show the crane loading trucks and handling steel.

To obtain the literature write to the Hyster Co., 2902 N. E. Clackamas St., Portland 8, Oreg., or use the Request Card at page 18. Circle No. 47.

Ten firms, including U. S., German, and French companies, have submitted bids for the proposed 5.2-mile Maracaibo bridge in Venezuela, S. A., a combination bridge and tunnel for auto and rail traffic.



## ...because white concrete reflecting curb points the way

Highly visible, day or night, wet or dry, this glistening white concrete ribbon stretches as far as the eyes — or headlights — can see. Curbs and slopes show up in ample time — much quicker to find and easier to see than any readable sign. Even in pouring rain, the wet saw-tooth surfaces of this white curb reflect headlight rays back to the driver when his need for guidance is greatest. Knowing the added safety — through added visibility — designers and builders are installing white concrete curbs — made with Atlas White Portland Cement — as standard equipment on the highways of

today and tomorrow. What's more, no modern highway should be without them. Write for further information on how Atlas White Cements are contributing to highway safety.

### UNIVERSAL ATLAS CEMENT COMPANY

UNITED STATES STEEL CORPORATION SUBSIDIARY

100 PARK AVENUE, NEW YORK 17, N. Y.

Albany • Birmingham • Boston • Chicago • Dayton • Kansas City • Milwaukee  
Minneapolis • New York • Philadelphia • Pittsburgh • St. Louis • Waco

# Atlas® White Cement

FOR CONCRETE REFLECTING CURBS AND MARKERS

United States Steel Hour-Televised on alternate Wednesdays-See your local newspaper for time and station.  
For more facts, use Reader-Reply Card opposite page 18 and circle No. 389

## Cement gel

■ Plastiment concrete densifier, a product of Sika Chemical Corp., controls the size and action of cement gel, according to a mailing piece. Cement gel, the initial reaction product between cement and water, is the governing factor in controlling the uniformity, structural quality, and cracking of concrete. The literature states that Plastiment reduces gel size, retards hydration, and offsets high-temperature damage in direct proportion to the quantity that has been added.

To obtain the mailing piece write to Sika Chemical Corp., 35 Gregory Ave., Passaic, N. J., or use the Request Card that is bound in at page 18. Circle No. 130.



# PIPE PILES

For C-I-P Concrete Piles

**Foster Pipe Service  
Gives Big Job Savings**

The job advantages of Foster Service on cast-in-place concrete piles really pay off. You can count on full quantities of the right kind of pipe for your job—delivered to your work schedule as promised.

Stronger spiral-weld pipe is ideal for cast-in-place concrete piles. It has been driven 134 feet to refusal without damage or distortion—is lightweight, easy to handle—drives straight without mandrel.

Foster specializes in all kinds of pipe for foundation piling—Spiral Weld, Electric Weld, Seamless and Lap Weld, in all diameters, all walls. Write for driving logs and catalogs—let us quote you on your next job.

STEEL-SHEET PILING • LIGHT-WEIGHT PILING  
H-BEARING PILE • RAILS  
TRACK EQUIPMENT • PIPE & FABRICATION

**L.B. FOSTER co.**

PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4  
ATLANTA 8 • HOUSTON 2 • LOS ANGELES 5  
For more facts, circle No. 390



The UniViber plug-in electric concrete vibrator is compact enough to be transported in the back of a passenger sedan.

## Electric vibrator is one-man-operated

■ High work-time efficiency, greater use flexibility, and full portability are three operational features claimed for the new UniViber plug-in electric concrete vibrator, manufactured by the Viber Co. The one-man-operated rig includes a motor housed in the head, a flexible casing used as a handle, and a switch located within easy reach of the operator.

The UniViber head is available in two models. Model 1M3R has the Viber-patented replaceable rubber tip and Model 1M3 consists of the housing with a steel nose. Another feature is the one-piece Viber-patented eccentric weight, tapered to produce

minimum vibration at the point where commutation takes place and mounted on open-type ball bearings. The vibrator bearings have non-metallic separators and are splash-lubricated. The diameter of the head is 3 inches.

The UniViber has a universal-type motor with glass insulation. It may be plugged into any standard 115-volt ac or dc source. No special frequency is required. The motor is cooled by surrounding concrete.

For further information write to the Viber Co., 726 S. Flower St., Burbank, Calif., or use the Request Card at page 18. Circle No. 14.



New portable TENNANT machine...

## removes traffic lines in 1 fast operation

For about 1¢ to 3¢ per foot... this machine provides a practical method of erasing old traffic lines. Does a complete job—without need for extra equipment, chemicals or large crews. Works up to 5 times faster than other methods. Easy handling makes it ideal for use on streets, highways, parking lots, airports, etc. Works during normal hours without tying up traffic.

Does permanent job without injury to pavement. Machine has self-propelling action. Operator merely guides it over traffic lines. Cylindrical tool with scores of steel cutters revolves at 1450 rpm—smoothly shaves off paint in one operation. Covers path 4" wide; adjustable to cover path up to 7" wide.

- Works up to 5 times faster than other methods.
- Erases paint lines permanently; does not hurt surface.
- Portable... one-man operation... has self-propelling action.
- Works during normal hours without tying up traffic.
- May be used on concrete or asphalt.
- Covers path 4" wide; adjustable up to 7" width.

Write today for details.

G. H. TENNANT COMPANY  
2534 N. 2nd Street, Minneapolis 11, Minn.



**TRAFFIC LINE  
REMOVING MACHINE**

**SPECIALIZED MAINTENANCE EQUIPMENT**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 391

## Diesel engine uses

■ A reference manual listing over 1,000 models of construction machinery available with Detroit Diesel engines as standard or optional power is offered by the Detroit Diesel Engine Division of General Motors Corp. Over 150 manufacturers of air compressors, crushers, cranes, graders, loaders, pumps, tractors, and trucks are represented in the manual. Arranged in tabular form, the manual lists the company name, description of the particular unit, the model number, and the diesel-engine model.

To obtain the manual write to the Detroit Diesel Engine Division, General Motors Corp., 13400 W. Outer Drive, Detroit 28, Mich., or use the card at page 18. Circle No. 34.



## FAST, LOW-COST WAY TO INSTALL PIPE...

**push it under streets, roads,  
tracks, lawns with a timesaving  
GREENLEE HYDRAULIC PUSHER**

Speed underground piping jobs this way. GREENLEE Pusher is one-man-operated (by hand or with power pump), portable, simple to set up and use. No tearing up of pavement, floors, lawns... does away with extensive ditching, tunneling, backfilling, repaving. GREENLEE Pusher cuts job time to a fraction... often pays for itself on first job.



Two feet per minute average pushing time. GREENLEE Pushers are available in two sizes: No. 790 for 3/4" to 4" pipe... No. 795 for pipe over 4", concrete sewer pipe, large ducts. Average performance of No. 790, shown above with power pump, two feet per minute. Write for literature.



**GREENLEE TOOL CO.**  
2269 Columbia Avenue • Rockford, Illinois

For more facts, circle No. 392

**CONTRACTORS AND ENGINEERS**



This Motorola two-way mobile radio provides 100 watts transmitter power output at a power intake equivalent to conventional 60-watt units.

#### Mobile radio features improved power supply

A mobile, two-way radio rated at 100 watts transmitter power output on any channel in the 25 to 54-megacycle frequency band has been announced by Motorola. The unit incorporates a new dynamotor-vibrator power supply which, at a power intake equivalent to conventional 60-watt

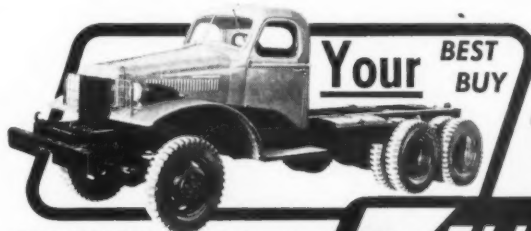
mobile radios, provides full-rated transmitter output, according to the manufacturer.

The transmitter is capable of up to four-channel operation with each frequency crystal-controlled. Motorola's Sensicon receiver, the transmitter, and the power supply are con-

tained in a compact steel case measuring approximately 6 x 15 x 20 inches.

The radio set operates interchangeably between 6 and 12-volt vehicles without adaptation or modifications.

For further information write to Motorola Communications and Electronics, Inc., 4545 Augusta Blvd., Chicago 51, Ill., or use the Request Card at page 18. Circle No. 106.



Your BEST BUY

UNUSED ORIGINAL GOV'T SURPLUS NEW-GUARANTEED 6 x 6's

CALL COLLECT to Sid Lieberman or Rich Medlock, for the best TRUE VALUE—Quality as well as Price.

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World's Largest Dealer of Unused Gov't Surplus Trucks

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**ELIGSON**  
TRUCK and EQUIPMENT COMPANY  
6707 E. ADMIRAL PLACE TULSA, OKLAHOMA  
PHONE TE 9-4477 SPECIALIZING IN TANDEM ALL-WHEEL-DRIVE 6X6 TRUCKS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 393

#### Offer compact, sturdy 3/4-ton lever hoist

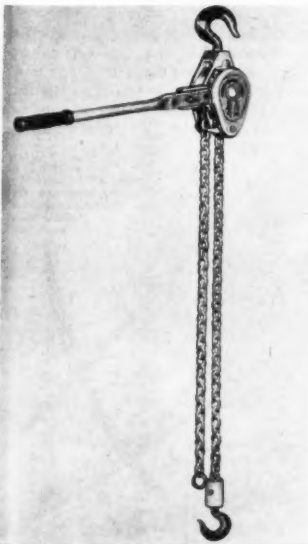
A 3/4-ton lever hoist using only 1/3 arc movement for operation has been announced by the Thern Machine Co., Winona, Minn. The unit is compact, portable, sturdy and yet light in weight, and is designed for angular, horizontal, or vertical lifting.

The special feature of the unit is operation of the hoist with only 1/3 of the total arc movement of the lever. This enables the hoist to be operated in tight or limited quarters. In addition, a special ratchet with two levers in constant contact with the ratchet wheel keeps the wheel under control at all times and gives positive assurance against slipping, according to the manufacturer.

The new lever hoist also has a chain which is said to provide perfect flexibility for more pulling or lifting jobs.

The main components of the hoist are aluminum alloy combined with a stronger, lighter, brass-plated, steel-alloy chain which is electrically welded. Top and bottom hooks swivel for easy, effortless turning of the load being moved. The standard chain length is 64 inches.

For further information write to the Thern Machine Co., Winona, Minn., or use the Request Card at page 18. Circle No. 116.

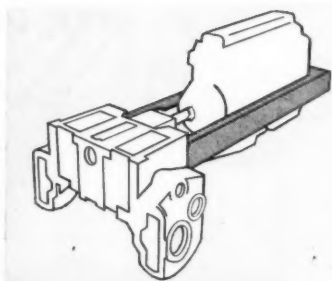


The Thern Machine Co.'s 3/4-ton lever hoist uses only 1/3 of the total arc movement of the lever for operation.



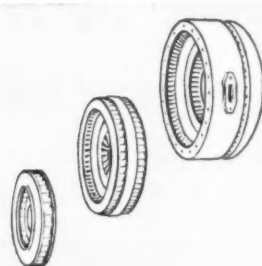
## ALLIS-CHALMERS HD-21

Engineered to take the **STRAIN**, the **SHOCK**, and the **GRIND** of Modern Construction



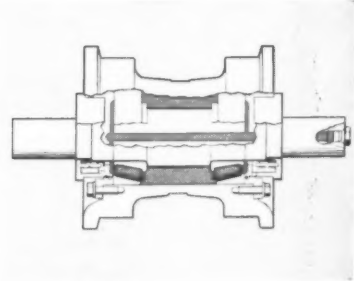
#### THE STRAIN

The Allis-Chalmers all-steel, Box-A Main Frame soaks up strains . . . does not use the engine as a structural member. It allows more efficient equipment mounting, provides excellent weight distribution and makes possible unit construction for unmatched servicing ease.



#### THE SHOCK

Sudden overloads are common in dozer operations. But hydraulic torque converter cushions shock, protects entire power train. This drive is standard equipment on the HD-21 and has been proved on Allis-Chalmers tractors since 1941.



#### THE GRIND

"Grinding compound" never reaches the truck wheel, support roller, idler and final drive bearings on an Allis-Chalmers tractor. Tapered roller bearings and Positive Seals keep dirt and moisture out and hold lubrication in for at least 1,000 hours without lubricating attention.

#### HD-21

204 net engine hp  
Approx. Weight (as illustrated)  
51,845 lb

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

**ALLIS-CHALMERS**



For more facts, use Reader-Reply Card opposite page 18 and circle No. 394

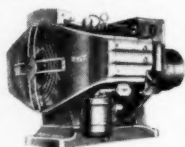
The Danuser all-purpose blade may be shifted 8 inches right or left for operation outside of the tractor wheel line.



Onan Model 5DRP mounted on trailer with extension lighting standard.



Series 3DSP, 3,000 watts, single-cylinder.



Series 5DRP, 5,000 watts, two-cylinder, opposed.

## Cut lighting costs with Onan portable air-cooled Diesel Electric Plants

Make substantial savings on any job where extensive night-lighting is necessary by using Onan Diesel-driven electric plants. Diesel fuel has a big edge in economy and it's readily available on job sites. Onan Diesel plants are built for rugged service, with extra-large bearing surfaces, Stellite exhaust valve seats and other long life features. Engine and generator are direct-connected... no belts or couplings. Air-cooling eliminates trouble from freezing or leaking coolants. Compact and light weight. Put an Onan Diesel Plant on your next job and check the savings.

Diesel Plants—3,000 and 5,000 watts.  
Gasoline Plants—500 to 50,000 watts.

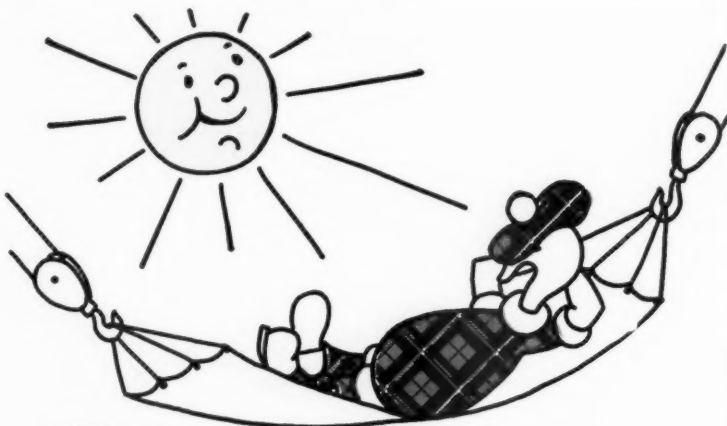
Write for folder



**D. W. ONAN & SONS INC.**

2864 University Ave. S.E., Minneapolis 14, Minnesota

For more facts, use Reader-Reply Card opposite page 18 and circle No. 395



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"LET GEORGE DO IT"

TAKE A LOAD OFF YOUR MIND



Illustrated: CHAMPION SNATCH BLOCK

Drop forged heat treated steel hooks, shackles, yokes and well rounded shells.

Patented opening feature permits easy insertion of line while block is suspended.

For working loads up to 25 tons. Available with hooks or shackles.

Write for catalog of this and other McKissick products.

**McKISSICK PRODUCTS CORPORATION**  
Box 2496—Tulsa, Oklahoma

McKISSICK BUILDS A BETTER BLOCK FOR EVERY PURPOSE

**McKISSICK**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 396



## All-purpose blade is one-man operated

■ An all-purpose blade that mounts on the rear of International tractors and performs a variety of earth-moving operations is available from the Danuser Machine Co. All adjustments for pitch, angle, leveling, and depth of cut are made by the operator from the tractor seat.

The attachment is recommended for grading, ditching, dozing, and backfilling operations. It is raised and lowered by the tractor's hydraulic system.

The blade is made of reinforced, welded structural steel. The 6 or 8-foot-wide moldboard is of medium

carbon steel and is supported on tapered roller bearings. The 3/8-inch-thick hardened-steel cutting edge is replaceable.

The moldboard rotates right or left in 15-degree increments to a maximum 45 degrees, and can be turned 180 degrees for backfilling and dozing. It can also be shifted 8 inches to either side for operation outside of the tractor wheel line.

For further information write to the Danuser Machine Co., 500 E. Third St., Fulton, Mo., or use the Request Card that is bound in at page 18. Circle No. 164.

## PCA plans expansion of field organization

The Portland Cement Association, with headquarters in Chicago, Ill., plans to open five new offices in order to expand its field organization. A new regional office in Los Angeles, Calif., will supervise activities of the Los Angeles and Seattle, Wash., district offices.

Four new district offices, to be located in Baltimore, Md.; Trenton, N. J.; Portland, Me.; and Louisville, Ky., will provide consultation services to users of portland cement. The association now has five regional offices and 32 district offices, covering most of the U. S. and British Columbia.

**PUT ALL YOUR PROFITS IN ONE BUCKET!**

**OMAHA DRAGLINE BUCKET**

Omaha Dragline Buckets get out and dig in for you...meaning bigger profits with every load. Alloy steel cutting teeth are tough and sharp. It's faster, smoother working. Nearly 50 years of "know-how" assures quality that lasts in the field. You can't buy a better bucket!

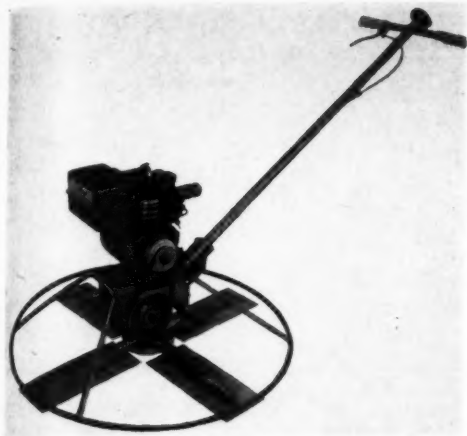
Write today for catalog of complete information and specifications for four types available.



**DRAKE-WILLIAMS MOUNT • OMAHA, NEBR.**

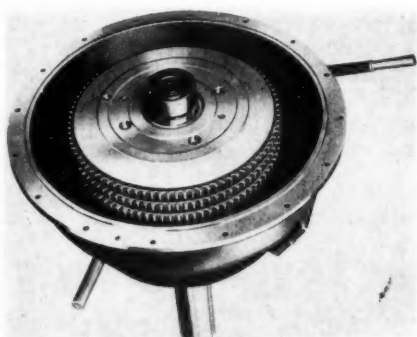
For more facts, use Reader-Reply Card opposite page 18 and circle No. 397

CONTRACTORS AND ENGINEERS



Trowel life is increased on the new Champion 4-blade concrete troweling machine because the blades are reversible. ▶

### Larger power takeoff added to firm's line



Twin Disc's SP-321 power takeoff handles up to 6,730 foot-pounds of torque and transmits 602 horsepower at 1,550 rpm.

■ The Twin Disc Clutch Co. has added a new model to its line of heavy-duty friction power takeoffs—the SP-321. The unit can handle up to 6,730 foot-pounds of torque and transmit up to 602 horsepower at 1,550 rpm, making it the largest in the SP line of power takeoffs.

Available with a standard SAE No. 00 flywheel housing adapter, the SP-321 features triple-driving-plate construction that provides ample friction

surfaces to withstand excessive heat. A pilot bearing with a double-width bearing race permits greater lubrication retention. A spherical roller bearing at the clutch output shaft allows greater overload and side-pull capacity.

For further information write to the Twin Disc Clutch Co., Racine Wis., or use the Request Card that is bound in at page 18 of this issue. Circle No. 119.

### Reversible blades add extra life to trowels

■ Four-bladed concrete troweling machines in 36 and 44-inch sizes have been developed by the Champion Mfg. Co. The blades are reversible for added trowel life.

Four-blade spider plates, plus the necessary attachments for the fourth trowel, are also available so that owners of standard 3-blade units can convert their equipment if they wish.

Other features of the new concrete troweling machines include a positive-action clutch that is said to assure smooth takeoff, and a stationary-type guard ring for safety and for trowel-

ing close to obstructions. The trowel tilt and acceleration controls are located together on the machine's handle.

For further information write to the Champion Mfg. Co., 2028 Washington Ave., St. Louis 3, Mo., or use the Request Card at page 18. Circle No. 159.

The last link in the 427-mile New York Thruway from Buffalo to New York City—a 3-mile stretch north of the New York City line—opened August 30th.

## Need HOSE in a HURRY?

Suction • Water • Steam  
Air • Multi-Purpose  
Discharge • Pile Driver

Wherever your job is—whenever you need hose—there's a Continental Warehouse nearby stocked to give you any kind of hose you want—when and where you want it.

There's no need to wait for distant shipments—no need to stop the job—no need to lose profits.

Any time you need hose call Continental. You'll like the fast service and dependable quality you get from these warehouses:

ATLANTA 5, Ga. 477 Eighth St., N.E.	INDIANAPOLIS 4, Ind. 309 North Capitol Ave.
BALTIMORE 18, Md. 15 East 21st St.	MEMPHIS 3, Tenn. 268 Madison Ave.
BOSTON (Alls. 34), Mass. 12 Franklin St.	NEW YORK 7, N. Y. 81 Murray St.
CHICAGO 10, Ill. 10 West Hubbard St.	PHILADELPHIA 6, Pa. 311 North Randolph St.
CINCINNATI 2, Ohio 49 Central Ave.	ST. LOUIS 8, Mo. 4018 Olive St.
CLEVELAND 15, Ohio 2731 Prospect Ave.	SYRACUSE 3, N. Y. 739 Montgomery St.
DETROIT 27, Mich. 13801 Schoolcraft Ave.	



Continental Road Hose—a high pressure water hose for rough use in road work. Top grade rubber tube is reinforced with frictioned duck wrapping thoroly bonded to tube and cover. Red Rubber cover resists abrasion, gouging—protects carcass. Sizes 1 1/4" thru 4". Ask for catalog of HOSE and PROTECTIVE CLOTHING.

**HOSE by CR**  
**CONTINENTAL**

CONTINENTAL RUBBER WORKS • 1989 LIBERTY ST. • ERIE 6 • PENNSYLVANIA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 399

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GEN-E-MOTOR

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When and Where You Need It!



- Dependable electric power
- Fast starting engines
- Lightweight, portable plants
- Skid mounted, heavy duty units
- Over 40 models from 500 watts to 12 KW continuous duty units

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**PIONEER GEN-E-MOTOR CORP.**  
1814 West Dickens Ave., Chicago 39, Ill.  
Generators • Electric Generating Plants  
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For more facts, circle No. 398

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magazine of modern construction

470 Fourth Avenue, New York 16, N. Y.

Estimated material and labor required for an expanded highway construction program

Calendar Year	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	Total 1957- 1969
<b>Structural Steel</b>	Units															
Wide Flange Shapes	Thousand tons															
Standard Shapes	444	663	809	880	918	944	944	944	944	944	944	944	944	866	814	11,839
Bearing Piles	211	303	370	402	419	431	431	431	431	431	431	431	431	395	371	5,405
Sheet Piles	96	144	176	191	200	205	205	205	205	205	205	205	205	188	177	2,572
Wide Piles	39	43	53	58	60	62	62	62	62	62	62	62	62	56	53	776
Standard Plates	135	202	246	268	279	287	287	287	287	287	287	287	287	264	248	3,601
Subtotal	983	1,442	1,760	1,914	1,996	2,052	2,052	2,052	2,052	2,052	2,052	2,052	2,052	1,882	1,769	25,737
<b>Reinforcing Steel (1)</b>	Thousand tons															
Bar	689	745	909	989	1,030	1,060	1,060	1,060	1,060	1,060	1,060	1,060	1,060	972	914	13,294
Wire	118	186	227	247	258	265	265	265	265	265	265	265	265	243	228	3,323
Subtotal	807	931	1,136	1,236	1,288	1,325	1,325	1,325	1,325	1,325	1,325	1,325	1,325	1,215	1,142	16,617
<b>Corrugated Metal Pipe</b>	Thousand tons															
Other Misc. Steel (2)	148	165	201	219	228	234	234	234	235	234	234	234	234	215	202	2,938
Total Steel	147	182	235	256	267	274	275	275	275	275	275	275	275	252	237	3,445
<b>Cement (3)</b>	Million bbls.															
Bituminous Material	2,085	2,720	3,332	3,625	3,779	3,885	3,886	3,886	3,887	3,886	3,886	3,886	3,885	3,564	3,350	48,737
<b>Aggregates (4)</b>	Million tons															
Purchased (5)	61.6	74.0	94.5	102.9	107.4	110.5	110.8	111.2	111.5	113.3	113.6	112.6	110.1	103.6	97.0	1,399.0
Produced (5)	5.85	7.15	8.73	9.49	9.90	10.18	10.18	10.18	10.18	10.18	10.18	10.18	10.18	9.34	8.77	127.67
<b>Lumber</b>	Million B. F.															
Timber Piling	201	228	278	303	316	325	325	325	325	325	325	325	325	298	280	4,075
Concrete Culvert Pipe	202	316	386	419	437	449	449	449	450	449	449	449	449	412	388	5,635
Clay Pipe and Tile	403	544	664	722	753	774	774	774	775	774	774	774	774	710	668	9,710
Petroleum Products (6)	385	403	492	535	558	573	573	574	574	574	574	573	573	526	495	7,194
Explosives	82	119	146	158	165	169	169	170	170	170	170	169	169	156	147	2,128
Labor (7)	2.64	2.89	3.29	3.57	3.72	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.51	3.30	48.03
	47	55	67	73	76	78	78	79	79	79	78	78	78	72	68	983
	652	744	908	987	1,029	1,059	1,059	1,059	1,059	1,059	1,059	1,059	1,059	971	913	13,280
	90	102	124	135	141	144	144	144	145	145	144	144	144	133	125	1,812
	323	365	424	442	443	441	426	414	398	394	384	370	354	326	302	5,118

- (1) Does not include reinforcement in concrete culvert pipe.  
 (2) Includes steel guard rail, fences, cast iron pipe, pavement joint devices, tubular piling, nails, etc.  
 (3) Does not include cement in concrete culvert pipe.  
 (4) Does not include aggregates in concrete culvert pipe.  
 (5) By contractors.  
 (6) Includes gasoline, diesel oil, lubricating oil, grease, etc.  
 (7) On-site requirements assuming 1,600 man-hours per year per worker.

## BPR forecasts materials needed for work under 13-year highway program

The amounts of materials needed for work under the 13-year expanded highway program, as forecast by the U. S. Bureau of Public Roads, are tabulated above on a yearly basis.

The estimate, which sets totals of 49 million tons of steel, 1,399 million barrels of cement, 128 million tons of bituminous material, and 9,170 million tons of aggregate to be used, encompasses all road-building work that will be done in the 13-year period. This includes construction under the \$32.9 billion program authorized by the Federal-Aid Highway Act of 1956,

work to be done with funds remaining from previous authorizations, federal-aid work that is expected to be authorized in the future, and construction that will be undertaken by state or local agencies without federal assistance. Materials needed for construction of airports and similar facilities, and for maintenance work, are not included in the totals.

According to the bureau, these estimates are based on the premise that highway expenditures, aside from those made by the federal government, will remain at the 1956 level

throughout the 13-year period. The estimates are also based on the assumption that prices will remain constant at the current level. Obviously, if material prices go up, more money will be used to purchase a smaller amount of material.

The BPR estimate is based on data reported on highway-construction projects involving federal funds. After analyzing the materials used in the past several years, the Bureau selected 1955 as an average year on which to base its estimate. In other years, the materials used varied widely—struc-

tural steel, for instance, being used to a great extent in a year when bridge construction was predominant. It was found generally that the 1955 factor was about average.

The labor requirement for road construction over the next 13 years is expressed in the chart in terms of man-hours per million dollars of construction cost, and is adjusted to the current price level. The estimate was made on the basis of the average worker being employed 1,600 hours per year, due to seasonal and weather conditions.

## Diesel Pays Big on Small Equipment, too!

**20** Gross H.P. at 2000 R.P.M.

**42** Gross H.P. at 2000 R.P.M.

**78** Gross H.P. at 2000 R.P.M.

**NEW DATA SHEETS**  
show how easily Sheppard Diesels can be  
interchanged with gasoline engines...  
without special engineering.

5 to 35 K.W. Generating Sets

Replace Gasoline Engines in Heavy-Duty Service  
**SAVE 4 WAYS ON POWER COSTS**

1. Stop frequent engine replacement
2. Save downtime caused by ignition and carburetor failures
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4. Save up to 75% on fuel costs

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TAKE LESS SPACE THAN "GAS" ENGINES

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SHEPPARD DIESELS • HANOVER 29, PA.

Send me data sheets on Sheppard 20 H.P. Model 17A ☐  
 42 H.P. Model 19 ☐ 78 H.P. Model 16 ☐  
 Generating Set Size \_\_\_\_\_ K.W.

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 Company \_\_\_\_\_  
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Available as optional equipment on most new machines... see your distributor for replacement power.

### WHY LUFKIN NEW Spring Lock Joints guarantee accuracy longer

Exclusive on "RED END" Folding Wood Rules

Exclusive Lufkin "Spring Lock" joints lock securely... eliminate end play... and maintain accuracy. Red End rules are straight-grained hard maple, tough and flexible. Bold black markings embedded in wood. Plastic coated for longer wear.

**X-46 EXTENSION RULE**  
6" brass slide for inside measurements. 50% heavier wood for extra heavy duty.

**066 — RED END RULE**  
All Red End features but without extension.

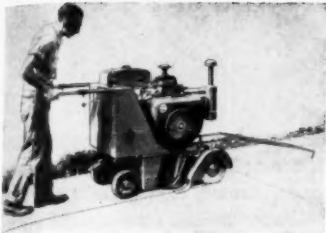
**066-D ENGINEERS RULE**  
Red End quality, marked feet, 10ths and 100ths; and feet, inches and 16ths.

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TAPES • RULES  
PRECISION TOOLS  
FROM YOUR SUPPLY STORE

**THE LUFKIN RULE COMPANY**  
SAGINAW, MICHIGAN

BETTER MEASURE WITH LUFKIN

For more facts, use Reader-Reply Card opposite page 18 and circle No. 401



Engineered Equipment's new concrete joint-cutting saw.

### New joint-cutting saw has improved design

■ Engineered Equipment, Inc., has announced a new concrete joint-cutting saw that will cut at any speed desired from 10 inches to 20 fpm, and can use 12 to 20-inch-diameter blades

with a simple change of the guard size.

The unit is available with Wisconsin 15, 25, or 36-hp air-cooled gas engines, either manual or self-starting.

The engine is mounted on the frame instead of the arm—a feature said to offer several advantages. There is no tilting of the machine; placement of the motor so the weight is over the blade provides better alignment of blade with cut; and the tendency of the blade to climb out of the cut is eliminated. The saw is said to travel in a straight line because it is designed with a direct drive to axle instead of to the wheels.

A hand-operated clutch reportedly gives smooth, safe operation. The automatic throttle control idles the motor when the blade is removed from the cut, eliminating one more hand operation.

For further information write to Engineered Equipment, Inc., Waterloo, Iowa, or use the Request Card at page 18. Circle No. 97.

### Device keeps record of vehicle operation

■ A precision instrument that permanently and accurately records the speed of a vehicle, the distance traveled, and the running, idling, and stopping time of the engine in synchronization with recorded time is available from the Wagner Electric Corp. Models of the Sangamo Tachograph showing mph or rpm for 12 or 24-hr periods are obtainable.

Information furnished by the Tachograph is recommended for use by employers in determining whether or not their vehicles operate at maximum efficiency. Truck fleet supervisors can study and compare the charts on which the device records its information to ascertain which runs and routes require the most time, cause the most erratic driving speeds, and



The Sangamo Tachograph provides a means for bringing about more efficient and economical operation of motor vehicles, both diesel and gasoline-engine driven.

result in the most delays, and where along the route these conditions are most prevalent.

This data on a vehicle's daily performance helps in planning measures to eliminate costly driving habits, lost time, extra mileage, unnecessary wear on engine and tires, and excessive consumption of oil and gasoline. The device is adaptable to either diesel or gasoline-driven engines.

For further information write to Dept. SPT, Wagner Electric Corp., 6400 Plymouth Ave., St. Louis 14, Mo., or use the Request Card at page 18. Circle No. 152.

### Marion Power Shovel makes four appointments

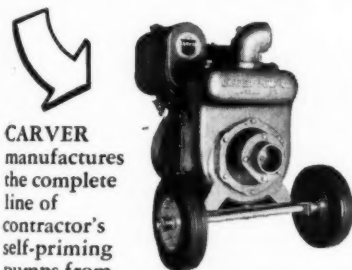
As a result of a reorganization of the firm's service department, Marion Power Shovel Co., Marion, Ohio, has made four appointments within the department. R. P. Sullivan is now manager of service and erection.

The former assistant service manager, C. S. Jarvis, will assume the post of service manager. He will be assisted by L. D. May and James S. Hotz.

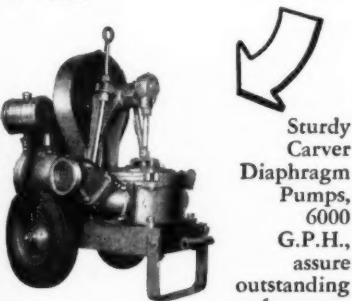
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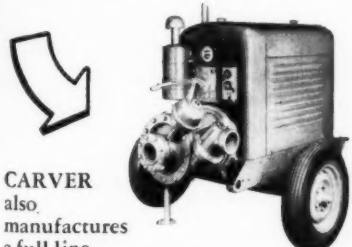
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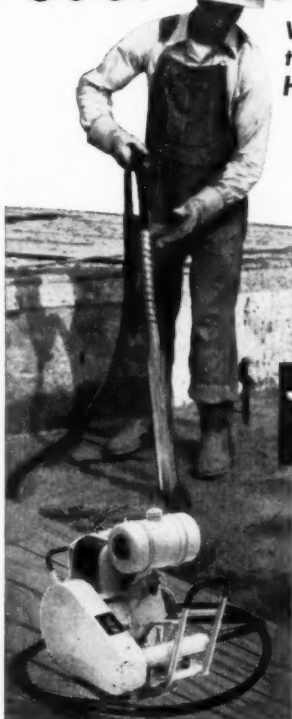
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For more facts, circle No. 402

SEPTEMBER, 1956

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HERE'S WHY:

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ELKHART 9, INDIANA



MODEL ME-13, with 2½ HP electric motor 110 V. AC or DC.

MODEL M-9 with 2 HP Louison engine, automatic clutch.



For more facts, use Reader-Reply Card opposite page 18 and circle No. 403

### Hyster plans to open new plant in Brazil

An expansion program planned by the Hyster Co., Portland, Oreg., will be sparked by a proposed opening of a new manufacturing plant in Sao Paulo, Brazil. To occupy 40,000 square feet, the wholly-owned subsidiary will supply Hyster-built material-handling equipment to overseas markets and will supplement production of the firm's plants in The Netherlands and in Scotland.

Robert E. Lange, Hyster's Washington, D. C., representative, will supervise the new Brazil facilities, and Kenneth E. Guptill, sales export representative for Latin America, will be sales manager. They will make their headquarters in Sao Paulo.

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## labor review

The number of workers employed in roadbuilding is expected to soar about 67 per cent by the peak year of 1960 as a result of the 13-year, \$100 billion highway program just getting underway, the Bureau of Labor Statistics reports. Currently, on-site highway construction workers number about 300,000. Next year's work force is expected to average nearly 350,000 and an employment high of 500,000 is foreseen by 1960.

Skilled workers, the bureau says, will outnumber semi and unskilled workers, 245,000 to 211,000 in 1960. The balance of the 500,000 employees

will consist of non-manual workers.

The Bureau of Public Roads paints a slightly different picture. This bureau's statisticians estimate that a total of 365,000 men are now employed in on-site highway construction, that next year's total will reach 434,000, and that the peak will come in 1959, when 443,000 men will be on the job.

Another prediction by the Bureau of Public Roads is that some 4,000 highway-building contracts will be awarded annually under the new highway program. On the basis of this estimate, the Labor Department has

asked Congress for an additional \$500,000 for its Solicitor's Office to administer the Davis-Bacon prevailing minimum wage provisions of the Federal Aid Highway Act.

Administrative Assistant Secretary Dodson, in an appearance before a Senate subcommittee, testified that the Secretary of Labor will have to make up to 12,000 wage determinations annually under the new Act.

Davis-Bacon has filtered down to the municipal level in Maryland. That state's Court of Appeals upheld the right of the city of Baltimore to require contractors to adhere to mini-

mum-wage scales determined by the Baltimore Board of Estimates in work done under city contracts. The Colwill Construction Co. had charged that the city wage-rate ordinance was an unlawful delegation of power to the Board of Estimates.

While the court agreed that the board had been given "considerable administrative power" to establish the minimums, it did not find that there was any actual delegation of legislative power. In addition, the wage classifications set up by the board were made in accordance with the recommendations of a "disinterested firm of engineers of great experience in construction work and sufficiently versed in wage costs to prepare a cost index".

Wage-scale determinations in New Jersey would not encounter the problem of changing pay rates if a plan set forth by Paul J. Brienza, Managing Director of the state's Building Contractors Association, were adopted. Brienza has proposed a three-point program to freeze the wages of construction workers in the state for 18 months on a cooperative labor-management basis.

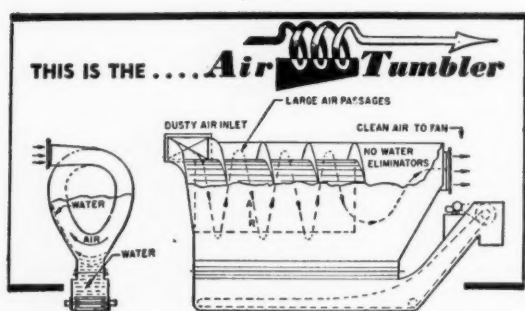
Brienza's plan calls for: (1) an immediate, cooperative, 18-month freeze at present scales and fringe benefits, (2) provisions for thawing the freeze and negotiating if the cost of living rises by 5 points; and (3) a special committee to make a comprehensive study of economic factors and data in order to present recommendations to stabilize wages in the industry.

Discussing the plan, Brienza said he felt it was a step "toward the protection of the economic prosperity we now enjoy." Stating that "the \$5.00 hourly wage is on the horizon for the construction industry," he warned, "let us not destroy the possibility of reaching that level by recklessly extending ourselves beyond the realm of being practical and realistic."

The high wages of building tradesmen were defended in a recent issue of "The Carpenter". In an editorial, the union's magazine compared the hourly rates of factory workers with building tradesmen and noted that although the construction worker may earn a higher hourly rate than some factory workers, he is worth more.

The editorial explained, "The degree of skill and training (the tradesman) needs is high. While a factory worker does pretty much the same jobs over and over again, the construction worker has to be ready and be able to do a dozen or a hundred different operations involving different skills. Too, plant employees often enjoy fringe benefits that not many construction workers yet have—paid vacations, paid holidays, etc. Steadiness of employment is another equalizing factor."

Speaking of construction salaries, they went up an average of 13.9 cents an hour during the first half of 1956, an analysis of 500 construction settlements reached during that period



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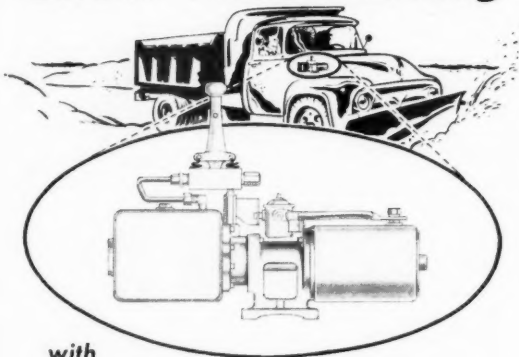
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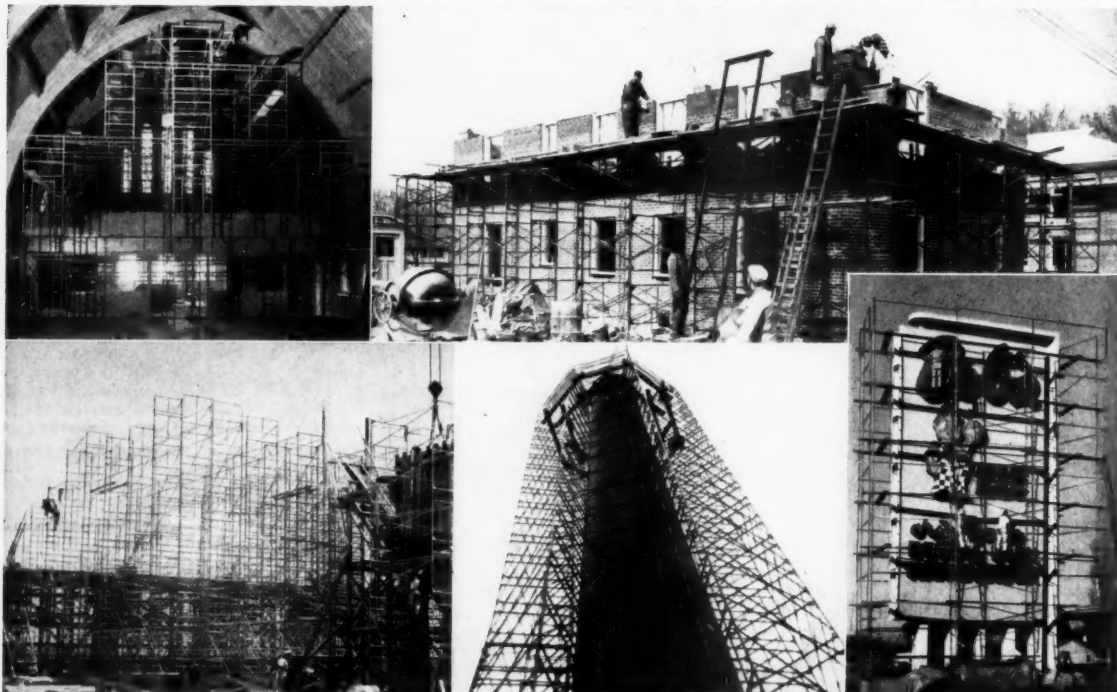
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shows. The analysis did not take into consideration fringe benefits paid by employers.

Painters' salaries jumped an average of 16.5 cents to record the largest gain. Plumbers were next with 15.8 cents, bricklayers rose 15.2 cents, and ironworkers gained 14.4 cents. Settlements involving teamsters provided for the smallest average increase, but fringe-benefit increases to this group were near the top of the list.

One group of teamsters feels it is losing too much time and money in recognizing strikes by other unions. Teamsters Joint Council 53, in Philadelphia, has advised other unions in its four-state jurisdiction not to count on its support in walk-outs unless these unions obtain its approval in advance. If it is informed of an impending strike in advance, Council 53 believes, it might be able to assist in exploring the possibilities for a settlement, thus averting the walk-out.

A statement issued by Council 53, which covers locals in eastern Pennsylvania, southern New Jersey, Delaware, and the eastern shore of Maryland, said: "It was unanimously agreed (that) no strike or picket line by any other labor organization (will) be recognized unless and until the union involved has appeared before the Teamsters Joint Council and received its sanction and indorsement."

Another group working toward a reduction in the number of strikes being called is the Joint Heavy and Highway Construction Committee and its affiliated area committees, made up of representatives of the teamsters, carpenters, laborers, and operating engineers. The committee, with a total jurisdiction that includes every state in the union, reaffirmed its policy that jurisdictional disputes would not be the cause of work stoppages.

Attempts to resolve disputes are to be made on a local level first, the committee's policy statement said. If unresolved, the disputes are "to proceed to international representatives and then to the national level". The statement maintained, "All work (is) to proceed while differences are being adjusted."

A recent issue of the laborers' monthly magazine clarified the role of the area committees, of which there are 19. According to the magazine, these committees are charged with "seeing that the four trades are employed on projects without discrimination to any of the participating organizations". They are also instructed to alert "favorable employers" to upcoming work, which they will learn about from the parent committee.

Commenting on the "no work stoppage" policy, the magazine noted, "Such a policy, when properly implemented, will enable contractors to bid on work without fear of suffering financial loss.

"If we succeed," the magazine continued, "in getting our contractors to bid on jobs with complete confidence by them in us that we will keep and

maintain this (no work stoppage) program, then this program must succeed; it cannot fail".

While most union members have a favorable attitude toward unionism in general and believe that their unions provide them with job protection and economic benefits that they otherwise would not get, many do not like some of the policies and practices of their locals, the University of Minnesota's Industrial Relations Center found out in a study of union members' attitudes.

The study was based on the answers to a series of 77 questions asked of a

sample of 1,121 unionized men from 13 union groups, representing about 14,000 union members. The sample group consisted of 280 union officers and 841 rank and filers.

As might be expected, the officials had a more favorable attitude toward unions than the workers. In general, the attitude of the men became more favorable as their age increased, up to 60. The attitude was less favorable in those with college training than in those with some high school training. Also, married members looked upon unions more favorably than their single brethren.

More than 80 per cent of the members agreed that there would be little protection against favoritism if it weren't for unions, that the growth of unions has made democracy stronger, and that employees have better wages and working conditions when all belong to unions.

Nearly four out of five of the persons interviewed agreed that "every worker should be expected to join the union where he works." Somehow, however, only half of those interviewed felt a worker should have to join a union in order to hold a job, the study revealed.

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# Weather charts

## The weather outlook for October

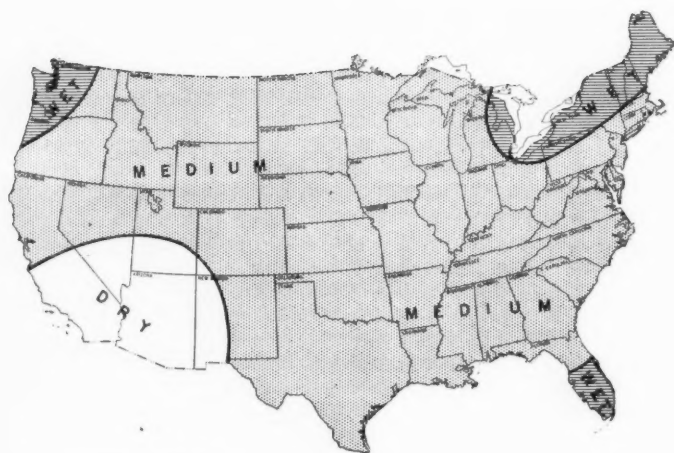


Chart I—Precipitation

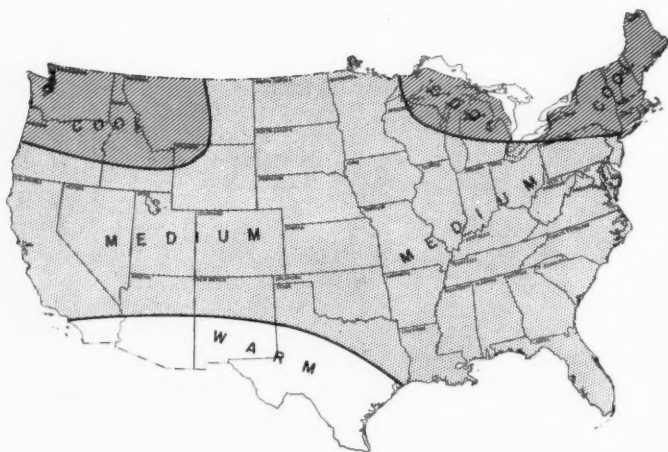


Chart II—Temperature

The two accompanying maps indicate the average weather conditions to be expected throughout the United States during the month of October. Chart I classifies the rainfall throughout the nation, and Chart II indicates the temperature range that may be expected during the month.

Dry areas indicated on Chart I will probably have fewer than four days of rainfall during the month. Between four and ten rainy days can be expected in medium regions, and wet areas will average more than 10 days of rain.

Warm areas indicated in Chart II will experience more than two days when the temperature reaches 90 degrees or higher. Areas marked medium will range from infrequent hours of 90 degrees to as many as two days when the temperature will rise that high. Cool regions will have no 90-

degree days.

The charts can also be used in a relative sense. New York State, for example, will probably have more rainy days than will Illinois, Indiana, and most of Ohio. Western Washington and northwestern Oregon will have more frequent periods of rain than will the eastern portions of those states. Similarly, southern Florida will no doubt have more rain than the northern section of the state.

Prepared for CONTRACTORS AND ENGINEERS by Weather Corp. of America, 39 Broadway, New York, N. Y., and 611 Olive St., St. Louis, Mo., the charts show only average conditions and are not intended as specific forecasts. However, Weather Corp. of America will answer readers' questions regarding the applied uses of climatology and meteorology in the construction industry. THE END

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For further information write to Servis Equipment Co., 1000 Singleton Blvd., Dallas, Texas, or use the Request Card at page 18. Circle No. 149

A new "Accident Rates" booklet, showing 1955 accident rates for various industries, including construction, has been published by the National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.



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### Organization changes made by Chain Belt

Two sections—a Construction Machinery Section and an Industrial Equipment Section—have been established by Chain Belt Co.

As a result of the change, there have been executive reassignments. O. W. Carpenter is now vice president of construction machinery and finance and will be responsible for the divisions making up the Construction Ma-

chinery Section. These include the Construction Machinery Division, Milwaukee, Wis.; the California Division, Los Angeles; and Chain Belt, Toronto, Canada.

A. K. Thomas is assistant to the vice president of the Construction Machinery Section, and W. C. Messinger is sales manager of the Construction Machinery Division.

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**ROAD SHOW** *DAILY*

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The impact of the \$32.9 billion federal-aid highway program enacted by Congress is beginning to be felt by the construction industry.

The government estimates that at the peak of the 13-year program—the largest public-works project on record—no fewer than 442,000 men will be employed directly on highway-construction jobs. Last year, road contractors employed 240,000 persons, and each increase of \$1 billion in the value of highway building over the 1955 level is expected to require at least 70,000 more employees.

Projections through the fiscal year 1969, the last year to be covered by the new highway act, indicate that a total of 5.1 million workers will be needed for the program on a cumulative basis over the 13-year period. Labor requirements will climb steadily to a high point in the 1958-60 period and then slowly decline to 302,000 in 1969. Part of the downward trend in later years is based on expectations of heightened labor productivity.

Materials requirements for the program are equally staggering. Some estimates of the U. S. Bureau of Pub-

lic Roads show that highway construction of all types over the next 13 years will take 1,399,000,000 barrels of cement; 7,194,000,000 board-feet of lumber; 48.7 million tons of steel; 2.9 million tons of corrugated metal pipe; and 127.6 million tons of bituminous material.

This, of course, represents needs stemming not only from the highway act of 1956, but also from other federal-aid authorizations expected in years to come, and work to be performed by states, counties, and municipalities without Washington aid.

In supplying cement to meet the construction timetable, cement producers plan to expand output to 400 million barrels yearly by some time in 1959, according to the Bureau of Public Roads. At the end of 1954, production capacity was said to be 294 million barrels.

But expansion takes time, and in the interim, the likelihood of shortages is strong. After studying the cement situation, the House Small Business Committee issued a report which concluded that the road program is going to create an "extremely tight supply", at least during 1957 and 1958. The strain to meet the demand for highway cement, it is stated, will be especially heavy if private, state, and local construction continue at a brisk pace.

Rep. Wright Patman (D., Texas), committee chairman, notes present plans of cement makers to increase output, but believes that they will not meet growing requirements. He points out that "acute local shortages" prevailed during much of 1955 despite the fact that national cement production during the past two years ran at 95 per cent of rated capacity for the first time in 60 years.

Many cement users, Patman says, "paid excessive freight charges to haul cement from distant parts of the country. In addition, for the first time in history, the country imported more cement from abroad than it exported."

Patman believes that the cement industry will have to continue operating at 95 per cent of capacity through 1960 to meet what he foresees as a demand of 382 million barrels in that year. He arrives at this figure on the basis of expected population increases, working from 1955 statistics which, he said, show that 1.8 barrels of cement were required for each person in the United States.

If shortages do accrue, Patman fears, many contractors and users either will have to do without cement or will have to hunt for supplies at "gray market" prices.

Machinery and equipment price increases as a result of the stimulation of the road-building program are still uncertain. The experience of the past few years, however, is anything but reassuring on this point. The Bureau of Labor Statistics reports that such prices rose 68 per cent in the period between January, 1947, and March, 1956, as construction activity steadily expanded. This rise was nearly three times that of the wholesale-price index for all commodities.

In the 1947-56 span, the price of tractor-mounted machinery increased 70.4 per cent; that of scrapers and graders, 60.7 per cent; and that of mixers, pavers, spreaders, and related equipment, 49.3 per cent.

Almost half of the rise (32.8 per cent) in the wholesale-price index for construction machinery and equipment has taken place in the last six

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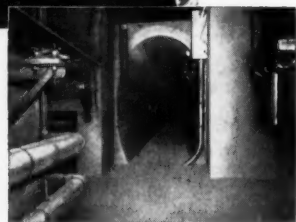
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years. Between December, 1954, and 1955 alone, according to the BLS figures, the index shot up 7.9 per cent.

**Work on the road program** is moving ahead fast, despite these problems. Secretary of Commerce Sinclair Weeks already has apportioned to the states a record \$2.55 billion in federal-aid funds for the fiscal period beginning next July 1. Ordinarily, the distribution would not have been made until the end of this year, but the government took action in advance in order to allow the states to start planning and location surveys so that engineers could prepare federal-aid projects for contracts.

The new apportionment is in addition to the \$1.12 billion distributed to states for the current fiscal year. The first installment was meted out when the highway bill became law.

The most spectacular aspect of the road program will, naturally, be the building of the 41,000-mile system of interstate highways linking the country from coast to coast. The announced standards for construction of this system give an idea of the enormity of the task—and the resultant benefits to motorists. All but 7,000 miles in the lightly-traveled areas will be four, six, and eight-lane divided highways. Design will be for speeds of no lower than 50 mph, even in urban sections, and access will be controlled for maximum safety. At-grade intersections will be eliminated as far as possible. Most traffic lanes will be at least 12 feet wide, most shoulders at least 10 feet wide, and most roadway separations at least 36 feet wide.

**The public works record** of Congress will be a talking point for many candidates as the election campaign gains momentum. Congress has passed the highway bill, calling for federal-state expenditures of \$32.9 billion over the next 13 years; the upper Colorado River Project, authorizing \$760 million to expand water supply in Colorado, Utah, Wyoming, and New Mexico; the omnibus housing bill, providing for the building of 35,000 public housing units in each of the next two years; and the water-pollution control bill, authorizing \$500 million for aid in sewage-treatment construction over a 19-year period. A military construction bill authorized some \$2 billion for sundry projects.

Federal-aid for school construction, building of \$308 million high-level federal dam at Hells Canyon, the Fryling Pan Arkansas Project in Colorado, and the Niagara River power-development measures were killed.

**Revising its outlook**, the government now expects new construction outlays in 1956 to total \$44.5 billion, which would be four per cent above the record \$43 billion established last year. Actually, the new estimate is quite close to what was predicted for '56 last November—\$44 billion.

New housing, according to the government, will decline more this year

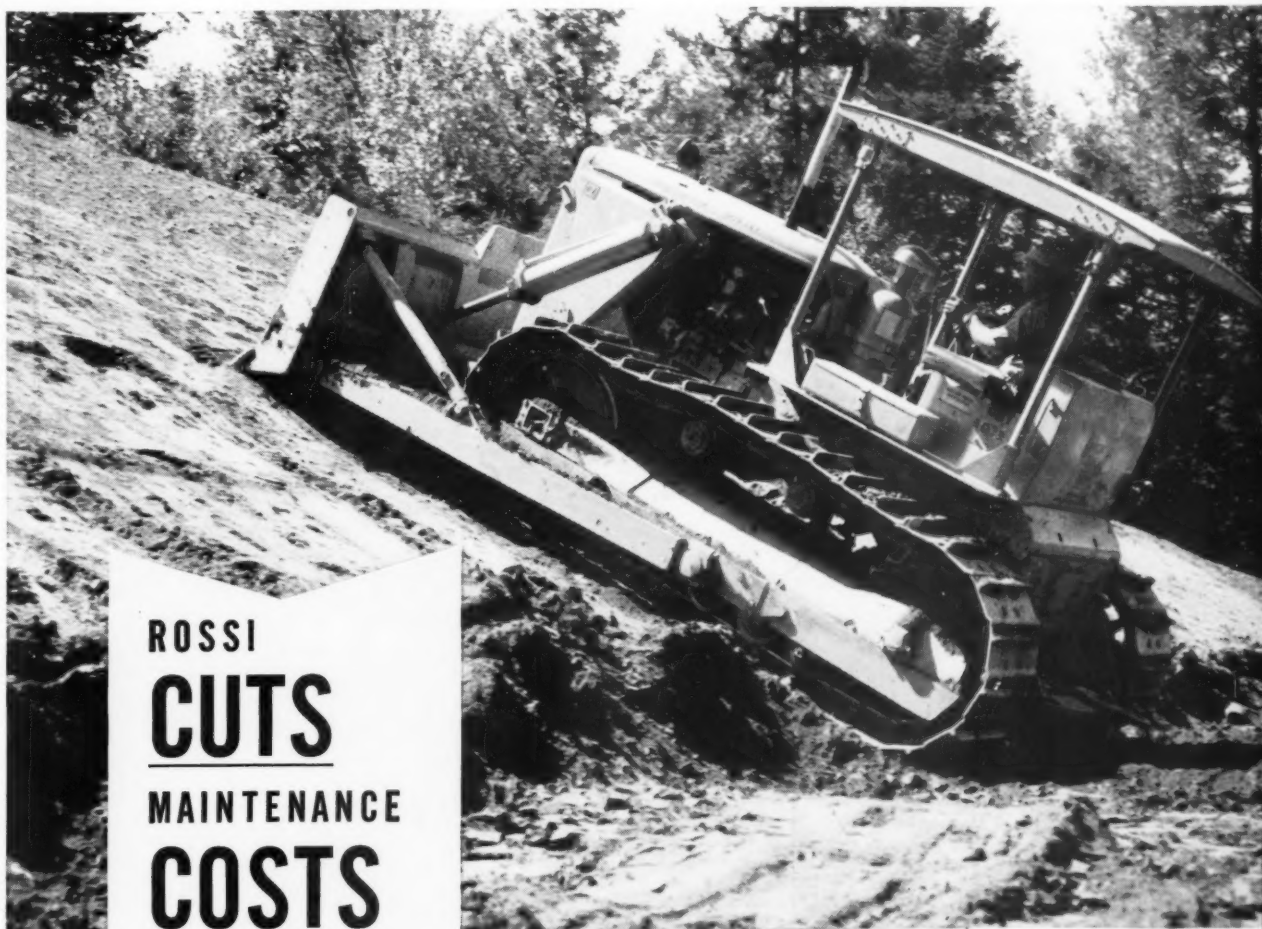
than was anticipated; but on the other hand, greater gains than predicted will show up in utilities, private industrial buildings, and highways.

The government forecast says that 1,150,000 new, private, nonfarm dwellings will be started this year, as com-

pared to 1,310,000 in 1955. Valuation of this 1956 construction is pegged at \$13.75 billion, 8 per cent below last year's \$15 billion. The anticipated decline in new-home building is explained by the fact that "funds for long-term, low-down-payment mortgages, at low interest rates, have re-

mained relatively scarce for a longer period than was foreseen last November."

However, new spending records for highways, utilities, and commercial and private industrial establishments are expected to more than offset the housing decrease. **THE END**



## ROSSI CUTS MAINTENANCE COSTS

# WITH CAT-BUILT EQUIPMENT

S. V. Rossi Construction Co., of Torrington, Conn., has found it pays to keep accurate records of machine costs. Here's a report by Mr. Adolph Rossi:

"When we buy a machine we figure the maintenance cost over a season. We've found there's no comparison—Caterpillar-built equipment has it over all other makes. We started in 1930 with machines built by two other manufacturers. Later we started trading them for Cat-built equipment because we had seen the light. Now we have all Caterpillar Diesel Tractors."

One of the machines in the Rossi fleet is the CAT\* D7 Tractor with No. 7S Bulldozer, shown here grading a slope on a road construction job between Bethel and Woodstock, Vermont.

The D7 is a long-time favorite with contractors—a rugged, dependable producer. Today the new D7 (Series C) gives you the added advantage of a 128 HP engine and 28,700 pounds maximum drawbar pull. It has the long-wearing Caterpillar oil clutch; a gear

driven balancer that gives smoother performance; a new starting engine with more power, and simple, single-lever control for easier operation. Track shoes are hardened by the "water-quench" process for longer life than ever.

Get the full facts about the new line of big yellow tractors from your Caterpillar Dealer. He'll give you a demonstration right on your job, and prove the claim of lower maintenance cost with facts. He offers reliable 24-hour service as well as a full stock of Caterpillar parts—parts you can trust. Call him today.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

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# Photo field-report on Michigan® Tractor Shovels

Here are some of the jobs you can do with a Michigan

Advertisement



## Strips asphalt

Deleo Brothers, Stamford, Conn. contractor, uses this 1½-yd Michigan to break up and load asphalt paving which was under-

mined in a recent flood. Low-level bucket action and power breakout force get full loads of material in low repose.



**Digs bankrun** On-the-job demonstration proved to Windsor Building Supply Co., Newburgh, New York, that this 2¼-yd Michigan would out-produce a crawler-loader of equal capacity.



**Lays pipe** Joe Agostino of Harbor Construction Co., Seattle, says his Michigan 75A "is like my right arm" . . . uses it for back filling, loading, crane work, even lays pipe with a special boom attachment.



**Backfills sewer trench** For improvement Co., San Francisco, backfills and grades sewer trenches with this 1-yd Michigan. Power-shifting is standard on all Michigans.



**Push-loads scraper** In San Jose, Calif., contractor A. J. Raisch mounted a pusher plate on rear of Michigan 175A, uses it for push-loading as well as conventional Tractor Shovel work. Torque converter boosts torque 300% as load increases.



**Excavates fire pit** Michigan 175A removes debris from fire pit at Sproul Lumber Co., Perryopolis, Pa. With an expert operator, a fully-loaded Michigan easily climbs steep grades like this! Unit carries loads near ground for better vision, stability.



**Pulls sheepfoot compactor** On Austin Company job in Midwest, a Michigan Model 75A-roller team handles the compaction on some jobs, Michigan's big rubber tires provide adequate compaction without a compactor!

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